

No. 2022-1630

United States Court of Appeals for the Federal Circuit

HARRIS BRUMFIELD, TRUSTEE FOR ASCENT TRUST,

Plaintiff - Appellant,

v.

IBG LLC, INTERACTIVE BROKERS LLC,

Defendants - Cross-Appellants.

Appeal from the United States District Court for the Northern District of Illinois in
Case No. 1:10-cv-00715, United States District Judge Virginia M. Kendall

OPENING BRIEF OF PLAINTIFF-APPELLANT HARRIS BRUMFIELD

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August 26, 2022

PATENT CLAIMS AT ISSUE

U.S. Patent Number 6,772,132

1. A method of placing a trade order for a commodity on an electronic exchange having an inside market with a highest bid price and a lowest ask price, using a graphical user interface and a user input device, said method comprising:
 - setting a preset parameter for the trade order
 - displaying market depth of the commodity, through a dynamic display of a plurality of bids and a plurality of asks in the market for the commodity, including at least a portion of the bid and ask quantities of the commodity, the dynamic display being aligned with a static display of prices corresponding thereto, wherein the static display of prices does not move in response to a change in the inside market;
 - displaying an order entry region aligned with the static display prices comprising a plurality of areas for receiving commands from the user input devices to send trade orders, each area corresponding to a price of the static display of prices; and
 - selecting a particular area in the order entry region through single action of the user input device with a pointer of the user input device positioned over the particular area to set a plurality of additional parameters for the trade order and send the trade order to the electronic exchange.

7. A method of placing a trade order according to claim 2, further comprising canceling said trade order in response to a subsequent single action of the user input device.

8. A computer readable medium having program code recorded thereon, for execution on a computer having a graphical user interface and a user input device, to place a trade order for a commodity on an electronic exchange having an inside market with a highest bid price and a lowest ask price, comprising:

a first program code for setting a preset parameter for the trade order;

a second program code displaying market depth of a commodity, through a dynamic display of a plurality of bids and a plurality of asks in the market for the commodity, including the bid and ask quantities of the commodity, aligned with a static display of prices corresponding thereto, wherein the static display of prices does not move in response to a change in the inside market;

a third program code for displaying an order entry region comprising a plurality of areas for receiving commands from the user input device to send trade orders, aligned with the static display of prices, each area corresponding to a price of the static display of prices; and

a fourth program code for receiving a command as a result of a selection of a particular area in the order entry region by a single action of the user input device with a pointer of the user input device positioned over the particular area, to set a

plurality of additional parameters for the trade order and send the trade order to the electronic exchange.

25. A method according to claim 1, further comprising dynamically displaying working orders in alignment with the prices corresponding thereto.

51. A computer readable medium having program code recorded thereon, for execution on a computer to place a trade order according to claim 9, wherein the bid order entry region overlaps with a bid display region and the ask order entry region overlaps with an ask display region.

U.S. Patent Number 6,766,304

1. A method for displaying market information relating to and facilitating trading of a commodity being traded in an electronic exchange having an inside market with a highest bid price and a lowest ask price on a graphical user interface, the method comprising:

dynamically displaying a first indicator in one of a plurality of locations in a bid display region, each location in the bid display region corresponding to a price level along a common static price axis, the first indicator representing quantity associated with at least one order to buy the commodity at the highest bid price currently available in the market;

dynamically displaying a second indicator in one of a plurality of locations in an ask display region, each location in the ask display region corresponding to a price level along the common static price axis, the second indicator representing a quantity associated with at least one order to sell the commodity at the lowest ask price currently available in the market;

displaying the bid and ask display regions in relation to fixed price levels positioned along the common static price axis such that when the inside market changes, the price levels along the common static price axis do not move and at least one of the first and second indicators moves in the bid or ask display regions relative to the common static price axis;

displaying an order entry region comprising a plurality of locations for receiving commands to send trade orders, each location corresponding to a price level along the common static price axis; and

in response to a selection of a particular location of the order entry region by a single action of a user input device, setting a plurality of parameters for a trade order relating to the commodity and sending the trade order to the electronic exchange.

12. The method of claim 11 wherein a location of the plurality of locations of the bid display region comprises a blank region in which there is no first or third indicator displayed.

15. The method of claim 14 wherein the bid order entry region overlaps with the bid display region and the ask order entry region overlaps with the ask display region.

17. The method of claim 16 wherein the entered order indicator is displayed in an entered order region.

22. The method of claim 1 further comprising the steps of:
displaying the first indicator at a first location associated with a particular price level on the common static price axis; and
repositioning the common static price axis such that the first indicator is displayed at a second location associated with the particular price level on the common static price axis.

27. A computer readable medium having program code recorded thereon for execution on a computer for displaying market information relating to and facilitating trading of a commodity being traded in an electronic exchange having an inside market with a highest bid price and a lowest ask price on a graphical user interface, the program code causing a machine to perform the following method steps:

dynamically displaying a first indicator in one of a plurality of locations in a bid display region, each location in the bid display region corresponding to a price level along a common static price axis, the first indicator representing quantity

associated with at least one order to buy the commodity at the highest bid price currently available in the market;

dynamically displaying a second indicator in one of a plurality of locations in an ask display region, each location in the ask display region corresponding to a the price level along the common Static price axis, the second indicator representing quantity associated with at least one order to sell the commodity at the lowest ask price currently available in the market;

displaying the bid and ask display regions in relation to fixed price levels positioned along the common static price axis such that when the inside market changes, the price levels along the common static price axis do not move and at least one of the first and second indicators moves in the bid or ask display regions relative to the common static price axis;

displaying an order entry region comprising a plurality of locations for receiving commands to send trade orders, each location corresponding to a price level along the common static price axis; and

in response to a selection of a particular location of the order entry region by a single action of a user input device, setting a plurality of parameters for a trade order relating to the commodity and sending the trade order to the electronic exchange.

U.S. Patent Number 7,676,411

1. A method of displaying market information relating to and facilitating trading of a commodity being traded on an electronic exchange, the method comprising:

receiving, by a computing device, market information for a commodity from an electronic exchange, the market information comprising an inside market with a current highest bid price and a current lowest ask price;

displaying, via the computing device, a bid display region comprising a plurality of graphical locations, each graphical location in the bid display region corresponding to a different price level of a plurality of price levels along a price axis;

displaying, via the computing device, an ask display region comprising a plurality of graphical locations, each graphical location in the ask display region corresponding to a different price level of the plurality of price levels along the price axis;

dynamically displaying, via the computing device, a first indicator representing quantity associated with at least one trade order to buy the commodity at the current highest bid price in a first graphical location of the plurality of graphical locations in the bid display region, the first graphical location in the bid

display region corresponding to a price level associated with the current highest bid price;

upon receipt of market information comprising a new highest bid price, moving the first indicator relative to the price axis to a second graphical location of the plurality of graphical locations in the bid display region, the second graphical location corresponding to a price level of the plurality of price levels associated with the new highest bid price, wherein the second graphical location is different from the first graphical location in the bid display region;

dynamically displaying, via the computing device, a second indicator representing quantity associated with at least one trade order to sell the commodity at the current lowest ask price in a first graphical location of the plurality of graphical locations in the ask display region, the first graphical location in the ask display region corresponding to a price level associated with the current lowest ask price;

upon receipt of market information comprising a new lowest ask price, moving the second indicator relative to the price axis to a second graphical location of the plurality of graphical locations in the ask display region, the second graphical location corresponding to a price level of the plurality of price levels associated with the new lowest ask price, wherein the second graphical location is different from the first graphical location in the ask display region;

displaying, via the computing device, an order entry region comprising a plurality of graphical areas for receiving single action commands to set trade order prices and send trade orders, each graphical area corresponding to a different price level along the price axis; and

selecting a particular graphical area in the order entry region through a single action of the user input device to both set a price for the trade order and send the trade order having a default quantity to the electronic exchange.

4. The method of claim 2, wherein the bid order entry region overlaps with the bid display region, and wherein the ask order entry region overlaps with the ask display region.

10. The method of claim 9, further comprising canceling the user's trade order represented by the entered order indicator in response to a single action of the user input device with the cursor of the user input device positioned over the entered order indicator.

11. The method of claim 1, further comprising receiving a re-centering command to center the inside market in a window of a graphical user interface.

26. A computer readable medium having stored therein instructions for execution by a computer to perform the following method steps:

receiving, by a computing device, market information for a commodity from an electronic exchange, the market information comprising an inside market with a current highest bid price and a current lowest ask price;

displaying, via the computing device, a bid display region comprising a plurality of graphical locations, each graphical location in the bid display region corresponding to a different price level of a plurality of price levels along a price axis;

displaying, via the computing device, an ask display region comprising a plurality of graphical locations, each graphical location in the ask display region corresponding to a different price level of the plurality of price levels along the price axis;

dynamically displaying, via the computing device, a first indicator representing quantity associated with at least one trade order to buy the commodity at the current highest bid price in a first graphical location of the plurality of graphical locations in the bid display region, the first graphical location in the bid display region corresponding to a price level associated with the current highest bid price;

upon receipt of market information comprising a new highest bid price, moving the first indicator relative to the price axis to a second graphical location of the plurality of graphical locations in the bid display region, the second graphical

location corresponding to a price level of the plurality of price levels associated with the new highest bid price, wherein the second graphical location is different from the first graphical location in the bid display region;

dynamically displaying, via the computing device, a second indicator representing quantity associated with at least one trade order to sell the commodity at the current lowest ask price in a first graphical location of the plurality of graphical locations in the ask display region, the first graphical location in the ask display region corresponding to a price level associated with the current lowest ask price;

upon receipt of market information comprising a new lowest ask price, moving the second indicator relative to the price axis to a second graphical location of the plurality of graphical locations in the ask display region, the second graphical location corresponding to a price level of the plurality of price levels associated with the new lowest ask price, wherein the second graphical location is different from the first graphical location in the ask display region;

displaying, via the computing device, an order entry region comprising a plurality of graphical areas for receiving single action commands to set trade order prices and send trade orders, each graphical area corresponding to a different price level along the price axis; and

selecting a particular graphical area in the order entry region through a single action of the user input device to both set a price for the trade order and send the trade order having a default quantity to the electronic exchange.

U.S. Patent Number 7,813,996

1. A computer readable medium having program code recorded thereon for execution on a computer having a graphical user interface and a user input device, the program code causing a machine to perform the following method steps:
 - receiving market information for a commodity from an electronic exchange, the market information comprising an inside market with a current highest bid price and a current lowest ask price;
 - receiving an input from a user that designates a default quantity to be used for a plurality of trade orders;
 - dynamically displaying a first indicator in one of a plurality of locations in a bid display region, each location in the bid display region corresponding to a price level along a static price axis, the first indicator representing quantity associated with at least one order to buy the commodity at the current highest bid price;
 - dynamically displaying a second indicator in one of a plurality of locations in an ask display region, each location in the ask display region corresponding to a price level along the static price axis, the second indicator representing quantity

associated with at least one order to sell the commodity at the current lowest ask price;

displaying the bid and ask display regions in relation to a plurality of price levels arranged along the static price axis such that when the inside market changes, the price levels along the static price axis do not change positions and at least one of the first and second indicators moves in the bid or ask display regions relative to the static price axis;

displaying an order entry region aligned with the static price axis comprising a plurality of areas for receiving commands from the user input device to send trade orders, each area corresponding to a price level of the static price axis; and receiving a plurality of commands from a user, each command sending a trade order to the electronic exchange, each trade order having an order quantity based on the default quantity without the user designating the default quantity between commands, wherein each command results from selecting a particular area in the order entry region corresponding to a desired price level as part of a single action of the user input device with a pointer of the user input device positioned over the particular area to both set an order price parameter for the trade order based on the desired price level and send the trade order to the electronic exchange.

14. The computer readable medium of claim 1, further comprising program code causing the machine to perform the following method step:

dynamically displaying an entered order indicator in association with the price levels arranged along the static price axis.

15. The computer readable medium of claim 14, further comprising program code causing the machine to perform the following method step:

canceling the trade order in response to a subsequent single action of the user input device with the pointer of the user input device positioned over the entered order indicator.

16. The computer readable medium of claim 1, further comprising program code causing the machine to perform the following method step:

receiving a re-centering command to center the inside market in a window of the graphical user interface.

FORM 9. Certificate of Interest

Form 9 (p. 1)
July 2020UNITED STATES COURT OF APPEALS
FOR THE FEDERAL CIRCUITCERTIFICATE OF INTEREST

Case Number 22-1630, -1639

Short Case Caption Trading Technologies International, Inc. v. IBG LLC

Filing Party/Entity Harris Brumfield, Trustee for Ascent Trust

Instructions: Complete each section of the form. In answering items 2 and 3, be specific as to which represented entities the answers apply; lack of specificity may result in non-compliance. **Please enter only one item per box; attach additional pages as needed and check the relevant box.** Counsel must immediately file an amended Certificate of Interest if information changes. Fed. Cir. R. 47.4(b).

I certify the following information and any attached sheets are accurate and complete to the best of my knowledge.

Date: 04/27/2022

Signature: /s/ Leif R. Sigmond, Jr.

Name: Leif R. Sigmond, Jr.

FORM 9. Certificate of Interest

Form 9 (p. 2)
July 2020

Additional pages attached

FORM 9. Certificate of Interest

Form 9 (p. 3)
July 2020

4. Legal Representatives. List all law firms, partners, and associates that (a) appeared for the entities in the originating court or agency or (b) are expected to appear in this court for the entities. Do not include those who have already entered an appearance in this court. Fed. Cir. R. 47.4(a)(4).

None/Not Applicable Additional pages attached

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5. Related Cases. Provide the case titles and numbers of any case known to be pending in this court or any other court or agency that will directly affect or be directly affected by this court's decision in the pending appeal. Do not include the originating case number(s) for this case. Fed. Cir. R. 47.4(a)(5). See also Fed. Cir. R. 47.5(b).

None/Not Applicable Additional pages attached

6. Organizational Victims and Bankruptcy Cases. Provide any information required under Fed. R. App. P. 26.1(b) (organizational victims in criminal cases) and 26.1(c) (bankruptcy case debtors and trustees). Fed. Cir. R. 47.4(a)(6).

None/Not Applicable Additional pages attached

FORM 9. Certificate of Interest, Continued

4. Legal Representatives. List all law firms, partners, and associates that (a) appeared for the entities in the originating court or agency or (b) are expected to appear in this court for the entities. Do not include those who have already entered an appearance in this court. Fed. Cir. R. 47.4(a)(4).

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STATEMENT OF RELATED CASES

Appeals from the same civil action that were previously before this Court include *Trading Techs. Int'l, Inc. v. Open E Cry, LLC (OEC)*, Appeal No. 2012-1583 (August 30, 2013), before Circuit Judge Lourie, Circuit Judge Plager, and District Court Judge Benson, sitting by designation, *Trading Techs. Int'l, Inc. v. Open E Cry, LLC*, 728 F.3d 1309 (Fed. Cir. 2013); *Trading Techs. Int'l, Inc. v. Open E Cry, LLC*, Appeal No. 2015-1547 (July 27, 2015), dismissed pursuant to Fed. R. App. P. 42(b); and *Trading Techs. Int'l, Inc. v. Rosenthal Collins Grp, LLC*, Appeal No. 16-2223 (October 11, 2016), before Circuit Judges Newman, Lourie, and Clevenger, *Trading Techs. Int'l, Inc. v. Rosenthal Collins Grp., LLC*, 669 F. App'x 568, 569 (Fed. Cir. 2016).

In the *OEC* decision, this Court considered, among other things, the '411 patent at issue in this appeal. Specifically, this Court considered the written description of the '411 patent and described “key aspects of the disclosed displays.” *OEC*, 728 F.3d at 1313. In holding that the district court erred in finding the '411 patent invalid, this Court found that the construction of a certain claim term (*i.e.*, “static”) in the '132 and '304 patents addressed in *Trading Techs. Int'l, Inc. v. eSpeed*, 595 F.3d 1340 (Fed. Cir. 2010) did not control the written description issue for the claims of the '411 patent, which do not recite “static.” *Id.* at 1319-20.

Additional appeals involving the same patents at issue in this appeal were also previously before this Court. On January 18, 2017, this Court heard an appeal involving the '132 and '304 patents in Appeal No. 2016-1616. *Trading Techs. Int'l, Inc. v. CQG, Inc. (CQG)*, 675 F. App'x 1001 (Fed. Cir. 2017) This Court (Circuit Judges Newman, O'Malley, and Wallach) affirmed the district court's ruling that the '132 and '304 patent claims recite patent-eligible subject matter under 35 U.S.C. § 101. Similarly, on February 13, 2019, and as part of this case, this Court heard an appeal involving the '132, '304, '996, and '411 patents in Appeal No. 2017-1732. *IBG LLC v. Trading Techs. Int'l, Inc. (IBG)*, 757 F. App'x 1004 (Fed. Cir. 2019). This Court (Circuit Judges Lourie, Moore, and Reyna) analyzed the inventions in all four patents and held that all four patents are for technological inventions (*i.e.*, they solve a technical problem with a technical solution), and not subject to CBM review.

Counsel is aware of no other cases pending in this or any other court or agency that will directly affect or be directly affected by this court's decision in the pending appeal.

JURISDICTIONAL STATEMENT

The United States District Court for the Northern District of Illinois had jurisdiction over this case under 28 U.S.C. §§ 1331 and 1338(a) because the action arose under the U.S. patent laws.

This Court has exclusive jurisdiction over this appeal under 28 U.S.C. § 1295(a)(1) because this appeal is from a final decision of a U.S. district court in a civil action arising under an Act of Congress relating to patents. Specifically, this appeal is from a final judgment, which disposed of all parties' claims, and was entered on September 7, 2021, and amended on January 11, 2022. Appx1-2. After the district court entered its order denying the motion for a new trial on February 22, 2022, the Notice of Appeal was timely filed under 28 U.S.C. § 2107 and Fed. R. App. P. 4(a) on March 24, 2022. Appx29-45; Appx103668-103670.

STATEMENT OF THE ISSUES

1. Whether the district court erred in granting summary judgment that the '411 and '996 patents are not patent eligible under 35 U.S.C. § 101 where this Court previously held in *IBG* that the '411 and '996 patents are for technological inventions because they each solve a technical problem identified in the specification using a technical solution?
2. Whether the district court erred as a matter of law by finding that foreseeable foreign damages are not legally compensable under § 271(a) where the Supreme Court in *WesternGeco* has already held that foreseeable foreign damages are legally compensable under § 271(f)(2)?
3. Whether the District Court abused its discretion by denying TT's¹ motion for "a new trial on damages and related requests all based on a finding of an attempt to commit fraud by defendant"?

¹ Plaintiff-appellant in this case is referred to as "Trading Technologies" or "TT" when referring to the plaintiff-appellant in the past tense (prior to the recent sale of TT, which is described below) or alternatively "Brumfield Trustee" when referring to plaintiff-appellant in the present tense (after the sale of TT).

STATEMENT OF THE CASE AND FACTS

I. THE CLAIMS OF THE '411, '996, '132, AND '304 PATENTS ARE DIRECTED TO A TECHNOLOGICAL INVENTION

The Brumfield Trust owns the '411, '996, '132, and '304 patents. Appx1747; Appx405; Appx3023; Appx2461. They all share the same specification. Appx82526; Appx83646. The claims of the '132 and '304 patents both recite a “static” price axis, which was construed in *eSpeed* to mean that the price axis cannot move unless moved manually. Appx64894. The '132 and '304 patents were before this Court in *CQG*, which held these two patents are patent eligible under 35 U.S.C. § 101. 675 F. App'x at 1004. In addition to a “static” price axis, the claims of the '132 and '304 patents also recite, among other things, movement of the market relative to the static price axis in combination with single action order entry. Appx1760-1761; Appx418.

Like the '132/'304 patents, the '411/'996 patents also recite a price axis and movement of the market relative to a price axis in combination with single action order entry. Appx2478; Appx3040-3041. This is explained below. The only difference between the '411/'996 patents and the '132/'304 patents relevant to this appeal is that the former do not recite a “static” price axis as construed in the '132/'304 patents. Appx92821. For instance, the '411 patent merely recites a “price axis.” And although the '996 patent recites a “static” price axis, “static” in the '996 patent claims was construed by the district court below (based on the

intrinsic evidence) to be broader than “static” in the ’132/’304 patents (*i.e.*, “static” in the claims of the ’996 patent is not limited to only manual repositioning of the price axis like “static” is in the ’132/’304 patents.). Appx64894-64897. As this Court has already found, however, the “static” limitation (as construed in the ’132/’304 patents) is not a “meaningful difference” for purposes of whether the patents solve technical problems with prior art GUIs. *IBG*, 757 F. App’x at 1008.

A. The Prior Art GUIs Had Technical Problems

At the time of the invention, there was a conventional wisdom regarding the design of order entry GUIs. Appx66653; Appx66558-66559; Appx66580 Appx66566; Appx66561-66563. Specifically, conventional screens for electronic order entry were dynamic order entry screens. Appx66559; Appx66562-66563; Appx66948-66967; Appx66869. Figure 2 of the ’411 patent (with annotations below) depicts an example of a dynamic order entry screen. Appx66559. On numerous occasions, this Court has considered this Figure 2-style prior art GUI and found that its construction created a technical problem, as set forth below. [cite to *IBG*, CQG].

This dynamic GUI always displayed the best bid/ask prices (called the “inside market”) in fixed locations on the screen (e.g., the same cell) and users could enter orders by clicking directly on a displayed price. Appx66559-66560; Appx82201-82205.

FIG. 2

The diagram shows a trade book with five rows labeled 1 through 5. Row 1 is the header. Rows 2 through 5 contain data. Red boxes with arrows highlight specific price levels:

- A red box labeled "Best Bid Price is Always Displayed Here" points to the BidPrc column of row 2 (value 7626).
- A red box labeled "Best Ask Price is Always Displayed Here" points to the AskPrc column of row 4 (value 7627).

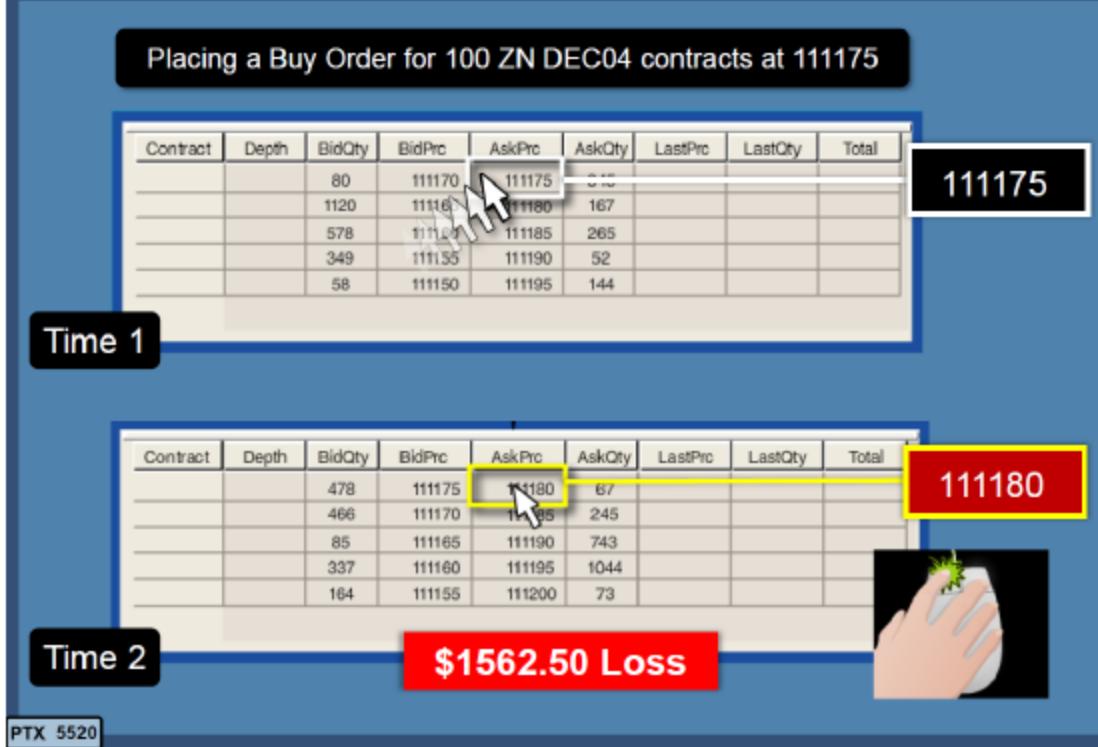
FIG. 2

	Contract	Depth	BidQty	BidPrc	AskPrc	AskQty	LastPrc	LastQty	Total	
1	CDHO	•	785	7626	7627	21	7627	489	8230	
2			626	7625	7629	815				
3			500	7624	7630	600				
4			500	7623	7631	2456				
5			200	7622	7632	800				

This order entry GUI was widely accepted for rapid order entry. Appx66558-66559; Appx66566; Appx66563. Inventor Brumfield noticed that the construction of the conventional, Figure 2-style GUIs caused him a significant problem: it caused him to enter orders at incorrect (i.e., unintended) prices. Appx66563-66565; *see also IBG*, 757 F. App’x at 1007; *CQG*, 675 F. App’x at 1002-03; Appx66527.

This accuracy problem is depicted below. At Time 1, Brumfield intends to get the price of 111175. However, because the best bid and best ask are always displayed in the same location, the intended price of 111175 unpredictably changes on the GUI just before he clicks on it. He misses his intended price, sending an order message at the higher price of 111180 (Time 2). Appx66565.

Problem With Conventional Screens



The above example illustrates just one price change before the user clicks. In this Figure 2-style screen, the prices associated with the inside market change each and every time the market changes. In fact, the screen is designed to change the prices every time the market changes due to the location of inside market being in a fixed location on the screen. The problem identified above was created solely by the design of the screen, not by the trader being too slow to act.

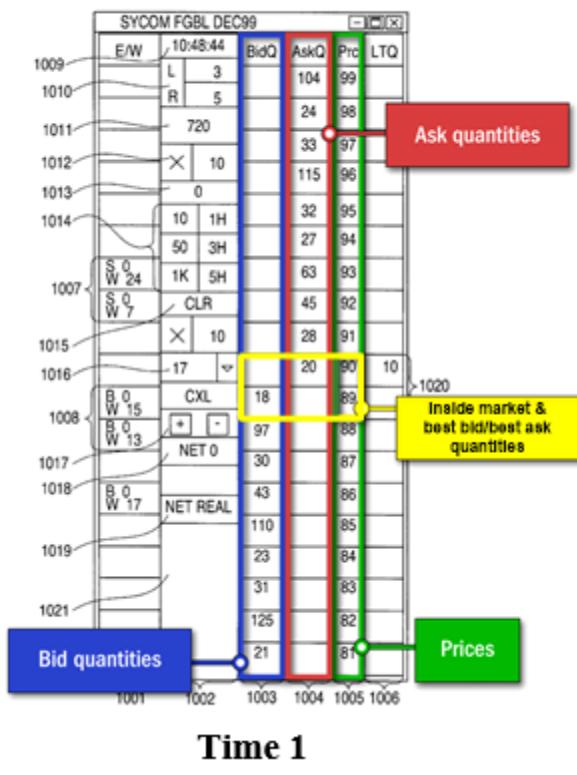
The structure of the Figure 2-style screen had another problem—it made it difficult for traders to ascertain the direction of the market movement. Appx66566; Appx6675; Appx66577. This is because the screen was designed such

that prices constantly changed positions (“flipped”) and did not provide visualization of ascending and descending market movements. Appx66564.

B. Brumfield Addressed These Problems with His Inventive GUI Tool

Brumfield overcame the problems experienced by prior screens by inventing a GUI tool that combined a dynamic display of bid and ask indicators that move relative to a price axis and an order entry region with locations corresponding to levels along the price axis, where each location of the order entry region is constructed to receive single action commands of a user input device (e.g., single-click of a mouse) to both set a price and send a trade order message with a default quantity to an electronic exchange. Appx66567.

While in the Figure 2-syle screen the prices associated with the order entry locations change every time the market changes--this is not the case with Brumfield’s invention, where the prices do not change every time the market changes, which is depicted below in Figures 3 and 4 of the ‘411 patent (with annotations). As shown in these Figures, the market changed (i.e., moved upward) but the prices did not move. Specifically, while the indicators of the inside market moved upward relative to the price axis, the prices along the price axis did not move:

FIG. 3**Time 1****FIG. 4****Time 2**

Appx3030-3031; *see also* Appx66567; Appx66575-66576; Appx82222-82227; Appx3038-3039.

The invention ran contrary to accepted GUI design at the time of the invention. Appx66574-66576; Appx66558-66568; Appx66653. Much like allowing an artificial horizon indicator in a cockpit display to move on the screen would be rejected, so too was allowing the inside market to leave a fixed location (as it was displayed in the Figure 2-style screen) such that a trader had to “chase” the inside market. Appx66552-Appx66553; Appx66556; Appx66574-66576. Likewise, the invention went against conventional wisdom by displaying prices even when no orders are present, unlike the Figure 2-style screen that only displays

prices when there are orders present at those prices. Displaying prices without orders (as provided in the invention) ran counter to conventional wisdom because it occupied valuable screen real estate. In other words, the price axis of the claimed invention (that displays price levels even with no orders present) requires more screen space than the Figure 2-style GUI that only displays prices with orders. Appx66561-66562; Appx66574-66576; Appx66580; Appx66653-66654; Appx66846; Appx66852; Appx66856; Appx66862; Appx66867; Appx66894; Appx66924-66927.

Even though the invention went against the conventional wisdom of the Figure 2-style GUI, the invention's relative movement addressed accuracy problems. Appx66575; Appx66587-66589; Appx66648; Appx66652-66653. Specifically, in Figure 2-style GUIs, every time a user enters an order (via a single action) at the moment of a market change (which occurs unpredictably and frequently), she will enter an order at an unintended price (i.e., she will miss her intended price). Appx66563-66565. That is, because the location of the inside market was fixed on the screen, as the market changed, prices would change positions or “flip” in the price cells. *Id.* In this prior Figure 2-style screen, every time the user clicks to enter an order at the moment of an inside market change, the user will send an order at an unintended price due to the inside market prices changing positions or “flipping” in the price cells. *Id.*

The invention provides a new structure and function for an order entry tool that addresses this problem. As shown in Figures 3 and 4, above, when the market changed (i.e., the inside market moved upwards), the prices did not (i.e., the prices did not change positions or “flip” in the price cells when the market changed), creating an improved GUI tool as compared to the Figure 2-style GUI.

Appx66574-66576; Appx66648. In other words, with the Figure 2-style GUI, the prices change positions or “flip” in the price cells every time the market changes, whereas in the invention that is not that case, namely, the prices do not change positions every time there is a change in the market, as shown in Figures 3 and 4. This explains why Figures 3 and 4 show movement of the best bid/ask indicators of the inside market relative to the price axis. That is, because the invention keeps the price levels in the same location at the moment of at least one market change, the best bid/ask indicators of the inside market move relative to the price axis. As such, the invention improves the price accuracy over the Figure 2-style GUI.

Appx66574-66576; Appx66648; Appx66527; Appx66894; Appx66872; Appx66884-66886; Appx66893-66894.

The invention also provides the user with a visualization of market changes. Specifically, the invention enabled users to see the movement of the inside market (due the inside market indicators moving along a price axis), which was an improvement over the Figure 2-style screen. Appx66577; Appx3038. The Figure

2-style screens provide no such relative movement of the best bid/ask indicators of the inside market. Rather the Figure 2-style screen fixes the location of such indicators in designated locations on the screen. This Court has recognized that the '411 patent's claimed relative movement provides visualization improvements over the prior art:

According to the [']411 patent[], traders able to view and quickly appreciate such detailed market data can more readily identify (and capitalize upon) developing trends in an active market. To that end, the disclosed graphical user interfaces offer a logical and intuitive means to convey dynamic market information using bid, ask, and inside market indicators that visually track ongoing price fluctuations along the price column.

OEC, 728 F.3d at 1313-14 (citation omitted); *see also Trading Techs. Int'l, Inc. v. eSpeed, Inc.*, 595 F.3d 1340, 1347 (Fed. Cir. 2010) (referring to Figures 3 and 4 as providing “numerous advantages over the prior art” including allowing users to “visually follow the market movement as the inside market shifts up and down along the price column”). This benefit was not provided by the prior Figure 2-style GUIs, which do not permit the user to visually follow the market movements shifting up and down along a price axis because the inside market is always located in the same location and the prices change positions (or “flip”) in the cells every time there is a change in the market.

Ultimately, the invention's benefits far outweighed the disadvantages.

Appx66568-66576; Appx66580; Appx66656-66790; Appx3038; Appx67037;

Appx67060; Appx66877-66946. Prior to the invention, the industry failed to recognize problems with the prior art. Appx66973; Appx66980; Appx66881; Appx66884; Appx66894; Appx66915; Appx66983; Appx66994; Appx67009; Appx67021; Appx67028. The invention changed the industry and spawned a whole new arena of innovation when it was introduced. Appx66567; Appx67034. The invention was the reason for the significant success Brumfield experienced in his cumulative trading results during the time that he was trading with the consulting software embodying the invention. Appx67076; Appx67069; Appx67043; Appx66915; Appx66577-66580. Moreover, the invention received extensive accolades, Appx66579-66581; Appx66586-66589; Appx82241-82246; Appx67078-67087; Appx67097; Appx67092; Appx67106-67107; Appx67115; Appx67166, and within just a few years following the introduction of the commercial embodiment of the invention, TT's sales increased by almost ten-fold. Appx67198-67201; Appx66580-66581; Appx66590-66593; Appx67208; Appx67225; Appx67229. As recognized by this Court during oral argument in *IBG*, the amount of objective evidence of non-obviousness for the claimed invention was among the highest ever presented by a patent owner. Recording of Oral Argument at 21:13, *Trading Techs. Int'l, Inc. v. IBG LLC*, No. 2017-2054 (argued Feb. 7, 2019), available at <http://oralarguments.cafc.uscourts.gov/default.aspx?fl=2017-2054.mp3> (Judge

Moore stating “they had a lot of objective evidence, or indicia. A lot. . . . This is, it’s really up there. It’s, it’s among the cases with the most, largest amount of objective indicia of non-obviousness that I’ve ever seen. It’s a lot”). IB’s counsel agreed, stating “[i]t is a lot.” *Id.* The industry also recognized that the claimed invention was a technological improvement over prior art GUI tools. Appx66649; Appx66590-66594; Appx67207; Appx67260; Appx67264-67269; Appx66877; Appx66897; Appx66906; Appx66911-66912; Appx66914-66917; Appx67025-67026; Appx67234-67249; Appx64254-64255; Appx67270-67274; Appx66874-66875; Appx67280-67282; Appx67289; Appx67313-67315. Rather than being well understood, routine, or conventional, Appx66648; Appx66653; Appx66629-66630; Appx66595-66644, numerous experts testified to the technical nature of the invention. Appx66817; Appx66822-66823; Appx66827; Appx66829; Appx66832; Appx66836; Appx66842. At the time of the invention, numerous industry groups invested substantially in creating and providing GUI tools for electronic trading, including IB, but no one arrived at the claimed inventions. Appx66552-66554; Appx66556-66558. And even after the invention was introduced, it was met with widespread industry skepticism. Appx66581-66586; Appx66645-66647; Appx67072-67073; Appx66852-66853; Appx67318; Appx67324-67325; Appx67329-67335; Appx67097-67100; Appx66916-66917; Appx66881-66882; Appx66924-66925; Appx66889-66890; Appx66874-66875.

C. This Court in *CQG* Held That the '304 and '132 Patents Are Not Abstract

The district court in *CQG* held that the closely related '304 and '132 patents were patent eligible under both prongs of *Alice*. *Trading Techs. Int'l, Inc. v. CQG, Inc.*, No. 05-CV-4811, 2015 WL 774655, at *5 (N.D. Ill. Feb. 24, 2015). Specifically, the district court concluded that “the claims at issue in both patents profess to solve problems of prior graphical user interface devices (GUIs), in the context of computerized trading, relating to speed, accuracy and usability.” *Id.* at *4.

This Court affirmed that decision, finding the '304 and '132 patents eligible under *Alice*, and made findings that confirm that the claims of the '304 and '132 patents solve the technical problem identified in the specification using a technical solution. *CQG*, 675 F. App'x at 1006. This Court noted that the district court “explained that the challenged patents do not simply claim displaying information on a graphical user interface. The claims require a specific, structured, graphical user interface paired with a prescribed functionality directly related to the graphical user interface’s structure that is addressed to and solves a specifically identified problem in the prior state of the art.” *Id.* at 1004. In affirming the district court’s decision, this Court held: “[t]he district court’s rulings are in accord with precedent. Precedent has recognized that specific technologic modifications to solve a problem or improve the functioning of a known system generally produce

patent-eligible subject matter.” *Id.* at 1004-05 (analogizing the claimed invention here to those of prior Federal Circuit decisions).

This Court concluded, after noting that there was no dispute the ’304 and ’132 inventions are an improvement to the accuracy of prior software, that: “the claimed subject matter is directed to a specific improvement to the way computers operate, for the claimed graphical user interface method imparts a specific functionality to a trading system directed to a specific implementation of a solution to a problem in the software arts.” *Id.* at 1006 (citations and quotations omitted).

D. In *IBG*, this Court Correctly Found That Each of the ’411, ’996, ’132, and ’304 Patents Are for a Technological Invention Because They Each Solve a Technical Problem with a Technical Solution

In *IBG*, this Court found that each of the ’411, ’996, ’132, and ’304 patents claim a technological invention. 757 F. App’x at 1007-08. Like in *CQG*, this Court in *IBG* pointed to the specification’s identification of a “technical problem with prior GUIs” like Figure 2 of the patents in which “the inside market remains stationary.” *Id.* at 1007. As the *IBG* Court explained:

[A] trader might intend to click on a particular price but, between the time he decides to do so and the time he actually clicks (which may be only hundredths of a second), the price may change. He may not be able to stop the downward motion of his finger and the order would be sent to market at an incorrect or undesired price.

Id. (alteration in original) (quoting Appx66527). The Court then found that the “patents at issue [’411, ’996, ’132, and ’304 patents] solve[] this problem ‘by displaying market depth on a vertical or horizontal plane, which fluctuates logically up or down, left or right across the plane as the market fluctuates.’” *Id.* (quoting Appx415).

IBG held that the ’132 and ’304 patents recite a “technological invention under any reasonable meaning of that term.” *Id.* at 1008 (quotations omitted). And significantly, *IBG* correctly held that there are “no meaningful difference[s]” between the claims of the ’132 and ’304 patents and the claims of the ’411 and ’996 patents regarding the technological invention question. *Id.* As set forth below, patents that solve a technical problem with a technical solution are, by definition, not abstract and are eligible under § 101.

E. The District Court Held That the ’411/’996 Patents Were Ineligible Under 35 U.S.C. §101

TT moved for summary judgment that the ’411, ’996, ’132, and ’304 are eligible as a matter of law. The district court agreed that the ’132 and ’304 patents are patent eligible based on this Court’s decision in *CQG*. Appx92818-92820. However, the district court found that the ’411 and ’996 patents are not eligible under either step of *Alice*. Appx92820-92823.

Regarding step 1, the district court found that that claims of the ’411/’996 patents do not solve the technical problem set forth in the specification because

they do not recite a “static” price axis. Appx92821. While the district court acknowledged that this Court found in *IBG* that the claims of the ’411/’996 patents are for technological inventions because they provide a technical solution to the technical problem set forth in the specification, the district court failed to apply *IBG* based on its incorrect view that *IBG* was not pertinent to § 101 eligibility. Appx92822. Instead, the district court relied on other § 101 cases from this Court dealing with different TT patents having claims that are different than the claims at issue here. Appx92822.

Regarding step two, the district court found that the claims of the ’411/’996 patents did not recite an inventive concept, again pointing to the “static” limitation. Appx92823. According to the district court, the ’411/’996 inventions “merely claim[s] a rearrangement of market information known to be displayed in a different format” and that this “rearrangement” does not solve a technical problem, even though in *IBG* this Court found the exact opposite, namely, that the claims of the ’411/’996 patent do recite a technical solution to the technical problem identified in the specification. *Compare* Appx92823, *with IBG*, 757 F. App’x at 1007-08. In making this finding, the district court ignored a multitude of record evidence concerning the unconventional nature of the claimed invention. *Compare* Appx92823, *with Appx66492-66498*.

II. THE DISTRICT COURT HELD THAT FORESEEABLE FOREIGN DAMAGES WERE NOT COMPENSABLE AS A MATTER OF LAW

TT's damages expert, Catharine Lawton, submitted her expert report on March 16, 2020. Appx87399-87967. In her report, she opined that TT was entitled to foreign damages based on IB's foreseeable distributions abroad. Appx87503; Appx87852-87854. Specifically, she concluded that, because IB makes the accused product in the United States in order to provide it to customers around the world, IB's harm extends to its "worldwide revenue which was both intended and foreseeable and the but-for result" of IB making the accused product in the United States. *Id.*

IB moved to exclude Ms. Lawton's damages opinions on November 5, 2020. Appx85127-85150. IB argued that Ms. Lawton's foreign damages theory, which was premised on infringing conduct under Section 271(a) of the Patent Act, was "contrary to CAFC precedent," under *Power Integrations*, and must be excluded. *Id.* at 15. In opposition to IB's motion to exclude, TT argued that *Power Integrations* had effectively been overruled by the Supreme Court in *WesternGeco*, which held that patentees may recover foreign damages under Section 271(f)(2) of the Patent Act. TT argued that "the only aspect of § 271(f)(2) relevant to the Supreme Court's analysis is that it addresses U.S. conduct," and since "[a]ll provisions of 35 U.S.C. § 271 regulate U.S. conduct," *WesternGeco* must apply

“equally throughout § 271.” Appx88408. Because IB’s infringing acts occurred under § 271(a), and because the reasoning in *WesternGeco* applies equally to § 271(a), TT argued that the district court should deny IB’s motion to exclude Ms. Lawton’s testimony. *Id.*

The district court agreed with IB and held that Ms. Lawton’s “inclusion of foreign users in her royalty base premised on a theory of foreseeable foreign consequences of infringement is premised on a misapplication of controlling law.” Appx19. Specifically, the court found that it was bound to follow the Federal Circuit’s decision in *Power Integrations* because the Supreme Court and Federal Circuit have not yet expressly held that *WesternGeco* overruled *Power Integrations*. *Id.* As explained below, however, the district court’s ruling was incorrect as a matter of law as it was contrary to the reasoning in *WesternGeco*. This Court should reverse the district court’s exclusion of Ms. Lawton’s testimony and remand for a new trial on damages.

III. AFTER A MONTH-LONG JURY TRIAL IN THIS PATENT LAWSUIT, PLAINTIFF WON VALIDITY AND INFRINGEMENT, BUT LOST DAMAGES. PLAINTIFF HAD ASKED FOR \$962 MILLION, DEFENDANT HAD PROPOSED \$3.3 MILLION, AND THE JURY AWARDED \$6.6 MILLION. PLAINTIFF UNCOVERED EVIDENCE POST-TRIAL THAT DEFENDANT GROSSLY MISREPRESENTED ITS INFRINGEMENT DATA, RENDERING THE JURY’S VERDICT UNSUPPORTABLE. PLAINTIFF FILED A MOTION WITH THE DISTRICT COURT REQUESTING “A NEW TRIAL ON DAMAGES AND RELATED REQUESTS ALL BASED ON A FINDING OF AN ATTEMPT TO COMMIT

FRAUD BY DEFENDANT”, WHICH THE DISTRICT COURT DENIED.

TT was the original plaintiff in this patent lawsuit against Interactive Brokers (IB), which was filed in February 2010. Appx57202. Harris Brumfield was the primary investor in TT and the majority shareholder of TT for 20+ years until its sale to 7RIDGE, Cboe, and SGX, which closed on December 21, 2021. Appx103656. Mr. Brumfield was also CEO of TT from 2003–2014 and Chairman of the Board from 2014–2018.

The patents asserted in this lawsuit are no longer owned by TT. Appx103656. They were spun out into a trust named Ascent Trust in conjunction with the aforementioned sale of TT. *Id.* The beneficiaries of Ascent Trust are the former shareholders of TT, of which Mr. Brumfield makes up 51%, one thousand current and former employees make up 40%, and three other investors make up 9%. Mr. Brumfield is the sole trustee of the Ascent Trust. *Id.* Accordingly, Mr. Brumfield on behalf of Ascent Trust was substituted for TT in this patent case against IB. Appx103482.

After a month-long jury trial (August 9, 2021–September 7, 2021) in this patent lawsuit, the jury returned the following verdict:

- Validity of patents in plaintiff’s favor

- Infringement of patents in plaintiff's favor, with an infringement period of August 2004–January 2021
- Damages of \$6,610,985 in defendant's favor, as plaintiff asked for \$962,440,850, while defendant proposed \$3,305,493
- No willful infringement in defendant's favor.

Appx93218-93227.

TT uncovered evidence post-trial that defendant grossly misrepresented its infringement data, rendering the jury's verdict unsupportable. TT filed a motion with the district court requesting “a new trial on damages and related requests all based on a finding of an attempt to commit fraud by the defendant.” The district court denied this motion.

A. The Key Folks From IB In This Case

Thomas Peterffy is the founder of IB, the Chairman of the Board at IB, the Head of Sales and Marketing at IB, and he owns 70% of IB. Appx101071; Appx101074. Mr. Peterffy is also the Corporate Representative for IB in this litigation. Mr. Peterffy was also CEO up until 2019. *Id.*

Milan Galik is CEO and President of IB and a member of IB's Board of Directors. Appx101322; Appx101331. Mr. Galik has been CEO since 2019 and

President since 2014. *Id.* Mr. Galik was also Senior Vice President of Software Development from 2003–2014. Appx101248.

Dennis Stetsenko is the engineering manager responsible for customer facing applications at IB and he reports directly to Mr. Galik. Appx101692-101693. Mr. Stetsenko joined IB as a software developer in 2004. *Id.*

B. IB’s BookTrader Tool Is The Tool Accused Of Infringement

IB offers two graphical user interfaces (GUIs) for Trader Workstation (TWS), TWS Classic (Classic) and TWS Mosaic (Mosaic). Appx103650. Classic was launched in 1995. *Id.* Mosaic was launched in 2012 and became the default version for TWS in 2014. *Id.* BookTrader is one of the many tools offered in Classic and Mosaic, and it is the tool accused of infringement in this case. *Id.*

For clarity, whenever we speak of a tool that “submits” orders, we are talking about “submitting” (sending) an order to the exchange.

IB excludes Socket (aka TWS API) when they measure the market share of tools by trades in TWS. Mr. Reed, IB’s damages expert, lays this out in his expert report. Appx85222-85225. We follow IB’s lead and drop Socket when considering market share of tools by trades in TWS.

C. The Data

The patent claims in this case are directed to a GUI order entry tool comprised of locations along a static price axis designed to receive single action commands to send (“submit”) electronic orders to the exchange. Appx103650.

In light of the claims, an important aspect of this case has always been the number of trades directly resulting from a user clicking along BookTrader’s static price axis to submit an order to the exchange. The damages theory on which IB prevailed was multiplying an asserted reasonable royalty times that number of trades.

In discovery, IB produced 550+ “stats reports” that IB senior management (including Mr. Peterffy, Mr. Galik, and Mr. Stetsenko), and software developers who were involved with the development of TWS, received on a weekly basis from June 2008–April 2019. Appx116269-116323. At trial, IB admitted these “discovery stats reports” into evidence. We have provided the “discovery stats report” for the week of March 24-28, 2014. Appx116269-116323.

At trial, for the first time, IB “made for presentation” a few of these “discovery stats reports”, including “making for presentation” the “discovery stats report” for the week of March 24-28, 2014, in two forms, and admitted these “made-for-presentation stats reports” into evidence. One of the “made-for-

presentation stats reports” for the week of March 24-28, 2014, was displayed as part of Exhibit DDX7-12. Appx133372.

At trial, for the first time, Mr. Galik presented the order entry tools that were available in TWS in 2006, 2009, and 2013. Appx133374. There were 38 order entry tools listed in 2013. Appx101601-102602; Appx94682.

The “made-for-presentation stats report” for the week of March 24-28, 2014, identifies for each of the 38 tools in TWS, the number of orders “submitted”. *See* Appx133372. The stats report also identifies “trades” as “filled.” Also, “Order Originator” is the term IB uses to label the 38 tools for order tagging purposes.

When we check the 550+ “discovery stats reports”, they reportedly show that BookTrader was only responsible for submitting 4.08% of the TWS trades from June 2008–April 2019. *See* Appx105512-132652. Our trading domain folks have always been adamant that this percentage was utter nonsense. Appx93494 (Peter Spiro email stating “99% of TWS orders come from main trading window, BookTrader, OptionTrader, BasketTrader, or API”).

SUMMARY OF THE ARGUMENT

I. THE DISTRICT COURT ERRED IN GRANTING SUMMARY JUDGMENT THAT THE '411 AND '996 PATENTS ARE NOT PATENT ELIGIBLE

This Court has already found that the claims of the '411/'996 patents recite technological inventions. *IBG*, 757 F. App'x at 1008. This finding resolves the issue of § 101 in TT's favor here. Claims that recite technological inventions by solving a technical problem using a technical solution are, by definition, not abstract under step 1 of *Alice*.

The district court erred in granting summary judgment that the '411/'996 are not patent eligible under § 101 in four ways. First, even though the district court acknowledged that *IBG* found that the '411/'996 patents recited technological inventions, it failed to rely on *IBG* to support a finding of § 101 eligibility because, according to the district court, *IBG* dealt with the technological invention exception to Covered Business Method (CBM) review and was not pertinent to patent eligibility under § 101. Appx92822. This was wrong—it is pertinent. In fact, *IBG*'s finding that the '411/'996 patents recite technological inventions by solving a technical problem with a technical solution establishes that the '411/'996 patents are patent eligible under step 1 of *Alice*. Indeed, the district court itself admitted that claims that solve a technical problem are patent eligible under step 1 of *Alice*: “claims that . . . solve a technological problem are patent eligible.”

Appx92817. And even though the district court acknowledged that this Court has already found in *IBG* that the '411/'996 patents solve a technical problem, it nonetheless erroneously concluded that the claims of the '411/'996 patents are not patent eligible. Not surprisingly, there has never been a case—and the district court cites none—finding an invention that solves a technical problem with a technical solution to be an abstract idea under § 101. In fact, as detailed below, there have been numerous cases finding the exact opposite, namely, that claims that solve a technical problem with a technical solution are patent eligible, all of which the district court ignored. *Compare Appx70768-70769, with Appx92822.*

Second, the district court erred by not extending the reasoning of *CQG* to the '411/'996 patents. In *CQG*, this Court found that the claims of the '132/'304 patents recite technological improvements that are eligible under both steps of *Alice*. 675 F. App'x at 1004. The claims of the '132/'304 patents are virtually identical to the claims of the '411/'996 patents, with the one exception being that the claims of the '132/'304 patents are limited to a “static” price axis, where the claims of the '411/'996 patents are not. Appx64893-64897. The district court reasoned that because the '411/'996 patents do not recite a “static” price axis as found in the claims of the '132/'304 patents, the eligibility finding in *CQG* cannot apply to the '411/'996 patents. Appx92821. The flaw in this reasoning is highlighted in *IBG*, where this Court specifically found that “static” is irrelevant to

the question of whether the '411/'996 patents recite technological inventions. Specifically, in *IBG*, this Court found that the '132/'304/'411/'996 patents all claim technological inventions regardless of the presence of "static" in the claims: "we see no meaningful difference between the claimed subject matter of the '132 and '304 patents and that of the '411 and '996 patents for the purposes of the technological invention question." 757 F. App'x at 1008. In so holding, *IBG* completely undercuts the district court's ruling that the lack of "static" in the claims of the '411/'996 patents means that those patents are not patent eligible under § 101. In sum, because this Court found in *IBG* that all four patents ('132/'304/'411/'996) are for technological inventions regardless of the presence of "static," the reasoning in *CQG* as to why the '132/'304 patents are eligible under § 101 should extend to the '411/'996 patents.

Third, instead of relying on *IBG*—the only case from this Court that actually considered whether the '411/'996 patents recite technological inventions—the district court veered off course and looked at other § 101 decisions involving different and unasserted patents. Appx92822. TT explains below why these decisions are not pertinent. In short, these other decisions do not change the fact that this Court already found in *IBG* that the '411/'996 patents are directed to technological inventions.

Finally, the district court erred in finding that the '411/'996 patents do not pass step two of *Alice*. Here, the district court found that the '411/'996 inventions did not recite an inventive concept based solely on the lack of a “static” price axis. Specifically, it found that, because of the lack of “static,” the '411/'996 inventions “merely claim[] a rearrangement of market information known to be displayed in a different format” and that this “rearrangement” does not solve a technical problem). Appx92823. But in *IBG* this Court found the exact opposite, namely, that the claims of the'411/'996 patent do recite a technical solution to the technical problem identified in the specification. *Compare Appx92823, with IBG, 757 F. App’x at 1007-08.* And significantly, this Court in *IBG* never relied on the “static” limitation in determining whether the '132/'304/'411/'966 patents recite a technological invention, and thus “static” is not relevant to the patent eligibility inquiry under § 101. *See IBG, 757 F. App’x at 1007* (finding all four patents solved the technical problem where a trader misses his “intended price” even though “static” is not present in the '411/'996 patents).

The district court also erred on the step two analysis for one additional and important reason. On summary judgment before the district court, TT presented overwhelming evidence that the claims of the '411/'996 patents were far from “well understood, routine, or conventional” to a person skilled in the relevant field, which demonstrates that the claims of the '411/'996 patent recite an inventive

concept under step two of *Alice*. Appx66491-66499. This evidence conflicted with IB's purported facts at step two, precluding summary judgment in IB's favor.

II. THE DISTRICT COURT ERRED IN PRECLUDING FOREIGN DAMAGES

The district court also erred by finding that TT cannot recover damages resulting from IB's conduct abroad ("foreign damages") that are the foreseeable result of IB's domestic acts of infringement under Section 271 (a). The Supreme Court has already held that foreign damages are compensable under a different section of the Patent Act—Section 271(f)(2). *WesternGeco LLC v. ION Geophysical Corp.*, 138 S. Ct. 2129, 2134 (2018). The Supreme Court's reasoning, which concluded that Section 271(f)(2) has a domestic focus, applies equally to Section 271(a), which has even more of a domestic focus, specifically, the act of making, using, offering to sell, or selling "within the United States."

Rather than apply the Supreme Court's reasoning to Section 271(a), however, the district court found that it was compelled to follow prior precedent from this Court, even though *WesternGeco* undercut the reasoning underlying that prior precedent in such a way that the cases are clearly irreconcilable. Appx19. By refusing to recognize the Supreme Court's *WesternGeco* decision as controlling, the district court erred as a matter of law.

III. THE DISTRICT COURT ERRED BY DENYING TT'S MOTION FOR A NEW TRIAL BASED ON IB'S PRESENTATION OF FALSE TRIAL TESTIMONY

In this case, IB had always represented that it was “solely tracking orders and trades in TWS by what tools the orders are submitted from.” On November 9, 2021, when IB replied to our motion for “a new trial on damages, etc.”, it was forced to admit that there are tools being attributed orders and trades that are not capable of submitting orders.

There has to be a major shift away from “tracking orders and trades by what tools the orders are submitted from” to reconcile “an enormous discrepancy between Accumulate/Distribute (1 of Mr. Galik’s “38 order entry tools from 2013”) and its trade volume.” Therefore, with this major shift, IB has grossly misrepresented the BookTrader data to be something that it is not.

Also, as a bonus, TT strongly believes that it knows “how IB is tracking orders and trades”, which is “by what tools set the symbols for orders.”

The district court’s opinion denying TT’s motion for “a new trial on damages and related requests all based on a finding of an attempt to commit fraud by IB” has several errors, including two critical errors. Therefore, its conclusion is wrong, and the district court has abused its discretion.

STANDARD OF REVIEW

This Court reviews the district court's § 101 ruling *de novo*. *Apple, Inc. v. Ameranth, Inc.*, 842 F.3d 1229, 1236 (Fed. Cir. 2016).

This Court also reviews the question of whether certain types of damages are legally compensable *de novo*. *DSU Med. Corp. v. JMS Co., Ltd.*, 471 F.3d 1293, 1308 (Fed. Cir. 2006) (citing *Rite-Hite Corp. v. Kelley Co., Inc.*, 56 F.3d 1538, 1544 (Fed. Cir. 1995)).

This Court reviews the question of a district court's ruling on discovery and post-trial Rule 59/60 motion under the abuse of discretion. *Louisville Bedding Co. v. Pillowtex Corp.*, 455 F.3d 1377, 1379 (Fed. Cir. 2006) (“A district court's denial of a motion under Federal Rule of Civil Procedure 60(b)(6) is not a procedural issue unique to patent law, and thus we will apply the law of the regional circuit court”); *Z4 Techs., Inc. v. Microsoft Corp.*, 507 F.3d 1340, 1347 (Fed. Cir. 2007) “[D]enial of a [Rule 59] motion for a new trial under regional circuit law.”); *Zivitz v. Greenberg*, 279 F.3d 536, 539 (7th Cir. 2002); *Dickerson v. Bd. of Educ. of Ford Heights, Ill.*, 32 F.3d 1114, 1116 (7th Cir. 1994) (Seventh Circuit uses an abuse of discretion standard of review of a Rule 60 denial.)

ARGUMENT

I. THE DISTRICT COURT ERRED IN GRANTING SUMMARY JUDGMENT THAT THE '411/'996 PATENTS ARE NOT PATENT ELIGIBLE UNDER § 101

A. This Court Has Already Found in *IBG* That the '411/'996 Patent Are for Technological Inventions, and Technological Inventions Are, by Definition, Not Abstract Under Step 1 of *Alice*

There is no dispute that this Court has previously analyzed the claims of the '411 and '996 patents in *IBG* and found that these claims recite a technological invention that solves a technical problem with a technical solution. *IBG*, 757 F. App'x at 1007-08. Although the district court agreed that it “may (and should) rely on nonprecedential opinions interpreting the same patent to ensure the uniform treatment of that patent,” and even though the district court agreed that *IBG* found that the '411 and '996 patents recited technological inventions, it failed to rely on *IBG* to support a finding of § 101 eligibility because, according to the district court, *IBG* dealt with the technological invention exception to CBM review and “did not concern § 101 eligibility.” Appx92818-92819; Appx92822. Specifically, the district court found that “[w]hile the inquiries under CBM review and § 101 eligibility are related, the *IBG* court’s decision does not dictate a finding of § 101 eligibility here.” Appx92822. This was error. These concepts are more than just “related.” In fact, *IBG*’s finding that the '411/'996 patents recite technological

inventions by solving a technical problem with a technical solution dictates a finding of § 101 eligibility under step one of *Alice*.

This Court’s finding in *IBG* that the ’411/’996 patents are for technological inventions controls the eligibility determination because claims that recite technological inventions by solving a technical problem with a technical solution are, by definition, not abstract ideas under step one of *Alice*. Indeed, the district court itself admitted that claims that solve a technical problem are patent eligible under step one of *Alice*: “[i]n the context of computer programs, claims that improve the way a computer operates or *solve a technological problem* are patent eligible.” Appx92817 (emphasis added).

Not surprisingly, there has never been a case—and neither the district court nor IB have cited any—finding an invention that solves a technical problem with a technical solution to be an abstract idea under § 101. In fact, there have been numerous cases finding the exact opposite, namely, that claims that solve a technical problem with a technical solution are patent eligible. *Ancora Techs., Inc. v. HTC Am., Inc.*, 908 F.3d 1343, 1349 (Fed. Cir. 2018) (citing the PTAB’s “technological invention” conclusion as persuasive under step one of *Alice*); *cxLoyalty, Inc. v. Maritz Holdings Inc.*, 986 F.3d 1367, 1378 (Fed. Cir. 2021) (“For the reasons provided above, the claims are directed to an abstract idea, and they implement the abstract idea using conventional techniques; the claims are not

directed to a technological solution to a technological problem.”); *Sophos Inc. v. Rpost Holdings, Inc.*, No. 13-12856-DJC, 2016 WL 3149649, at *12 n.6 (D. Mass. June 3, 2016) (finding the fact that the PTAB “denied petitions to institute covered business method patent reviews . . . tends to support [the eligibility] conclusion” because “covered business method patent reviews cannot be conducted on patents for technological inventions”); *United Servs. Auto. Ass’n v. Wells Fargo Bank, N.A.*, 414 F. Supp. 3d 947, 953 (E.D. Tex. 2019) (“The Court agrees with the PTAB that the Asserted Claims are directed at a technical solution to address a technical problem The Court, therefore, concludes that the Asserted Claims are eligible for patent protection under step one of *Alice*.” (quotations and alterations omitted)).

In addition, the case law is clear that claims that provide a technical solution to a technical problem to “improve” the relevant technology are patent eligible. Appx92817 (emphasis added); *Core Wireless Licensing S.A.R.L. v. LG Elecs., Inc.*, 880 F.3d 1356, 1363 (Fed. Cir. 2018) (upholding claims that “recite a specific improvement over prior systems, resulting in an improved user interface for electronic devices”); *Data Engine Techs. LLC v. Google LLC*, 906 F.3d 999, 1009 (Fed. Cir. 2018) (finding claim recited a specific and particular “manner of navigating a three-dimensional spreadsheet that improves the efficient functioning of computers.”).

Neither the district court nor IB has cited a single case holding that the technological invention question is not instructive to the eligibility determination. This Court’s finding that the ’411/’996 patent claims recite a technological invention resolves that the claims of the ’411/’996 patents are patent eligible.

B. The District Court Erred by Not Extending the Reasoning of *CQG* to the ’411 and ’996 Patents

1. This Court Has Already Found in *CQG* That the Closely Related ’132/’304 Patents Are Eligible

In *CQG*, this Court found that the claims of the ’132/’304 patents recite specific technological improvements in computer capabilities that are eligible under both steps of *Alice*. 675 F. App’x at 1006. Specifically, this Court agreed with the district court that the claims “solve problems of prior graphical user interface devices in the context of computerized trading relating to speed, accuracy and usability.” *Id.* at 1004 (quotations and alterations omitted).

2. The District Court Erred in Finding That the Claims of the ’411/’996 Patents Are Different than the Claims of the ’132/’304 Patents for Purposes of Patent Eligibility

The claims of the ’132/’304 patents are virtually identical to the claims of the ’411/’996 patents, with the one exception being that the claims of the ’132/’304 patents are limited to a “static” price axis, where the claims of the ’411/’996

patents are not.² Indeed, the only difference between the claims of the '132/'304 patents and the claims of the '411/'996 patents identified by the district court is the lack of “static” in the '411/'996 patents. Appx92821. The district court reasoned that because the '411/'996 patents do not recite a “static” price axis like the claims of the '132/'304 patents, the eligibility finding in *CQG* cannot apply to the '411/'996 patents. Appx92821. The flaw in this reasoning is highlighted in *IBG*, where despite IB’s repeated attempts to argue otherwise, this Court specifically found that “static” is irrelevant to the question of whether the '411/'996 patents recite technological inventions. *See infra* Section I.B.2.b. In short, because this Court found in *IBG* that all four patents ('132/'304/'411/'996) are for technological inventions regardless of the presence of “static,” the reasoning in *CQG* as to why the '132/'304 patents are eligible under § 101 should extend to the '411 and '996 patents.

a) The Court Has Already Found in *IBG* That There Is “No Meaningful Difference” Between the Claims of the '132/'304 Patents and the

² As explained above, the '411 patent claims do not recite “static,” and the “static” in the '996 patent claims was properly construed by the district court to be broader than “static” in the '132/'304 patents (*i.e.*, “static” in the claims of the '996 patent is not limited to only manual repositioning of the price axis like “static” as in the '132/'304 patents.). Appx64893-64897.

Claims of the '411/'996 in That They All Recite Technological Inventions

In *IBG*, this Court specifically analyzed the claims of the '132/'304/'411/'996 patents. 757 F. App'x at 1006-08. *IBG* started its analysis by acknowledging this Court's decision in *CQG* that the '132/'304 patents provide a technical solution to a technical problem and therefore are not abstract under § 101. *Id.* at 1007. Significantly, *IBG* then analyzed the claims of the '411/'996 patents, finding that the '132/'304/'411/'996 patents all claim technological inventions regardless of the presence of "static" in the claims: "we see ***no meaningful difference[s] between the claimed subject matter*** of the '132 and '304 patents and that of the '411 and '996 patents for the purposes of the technological invention question." *Id.* at 1008 (emphasis added). And as detailed below, this finding came after this Court considered, and rejected, IB's repeated attempts to convince this Court that the lack of "static" in the '411/'996 patents means that the '411/'996 patents are not technological inventions. *See infra* Section I.B.2.b. This Court's express finding in *IBG* that the '411/'996 patents are technological inventions undercuts the district court's finding that the lack of "static" in the claims of the '411/'996 patents means that those patents are not patent eligible under § 101.

b) This Court in *IBG* Repeatedly Rejected IB’s “Lack of Static” Argument That the District Court Mistakenly Adopted

In *IBG*, IB repeatedly argued to this Court that the lack of “static” in the ’411/’996 claims means that the ’411/’996 patents are not for technological inventions. This argument was correctly rejected by this Court multiple times as explained below. And yet, the district court wrongly hinged its decision to invalidate the ’411/’996 patents on this “lack of static” argument.

First, IB argued in its briefing in *IBG* that due to the lack of “static,” the claims of the ’411/’996 patents did not provide a technical solution to the technical problem described in the specification. Appx70920 (IB arguing “the claims do not solve TT’s asserted problems because they do not require a “static” price axis). This issue was also raised and discussed at oral argument, where Judge Reyna understood that the lack of “static” in the claims of the ’411/’996 patents is irrelevant:

TT’s counsel: If you look at the ’411 claim . . . taking out the word “static” doesn’t cast this claim into the realm of abstractness. . . . [b]ecause the ’411 claim has specific structure, make up, and functionality. It has a price axis, it has indicators . . .

Judge Reyna: Doesn’t it, doesn’t it also function the same way, even though it doesn’t recite a static price index, I mean, it . . .

TT’s counsel: . . . That’s exactly right.

Judge Reyna: . . . the functions are still there.

TT's counsel: The functions are still there. You have a price axis, you have relative . . .

Judge Reyna: And those functions are defined by the claim.

TT's counsel: That's right. You've got relative movement of the indicators, you've got an order entry region.

Oral Argument at 16:46, *Trading Techs. Int'l, Inc. v. IBG LLC*, No. 2017-2054

(argued Feb. 7, 2019), available at

<http://oralarguments.cafc.uscourts.gov/default.aspx?fl=2017-2054.mp3>. In its *IBG* opinion, this Court rejected IB's "static" argument, instead finding that "[t]he claimed invention in the [’132/’304/’411/’996 patents] solves th[e] problem" identified in the specification and that the ’411/’996 patents are for technological inventions. 757 F. App’x at 1007-08.

Second, IB re-raised its "lack of static" argument in its petition for rehearing, seeking reconsideration of the *IBG* decision. IB argued that this Court failed to consider "that the '411 patent does not claim TT's purported technical solution and does not solve TT's purported technical problem" because the "claims do not require a static price axis." Appx70925. Again, this Court considered IB's argument and for a second time, rejected it. Appx70933-70934 (denying petition for rehearing).

C. The Reasoning in *IBG* Was Correct--the Claims of the ’411/’996 Patents Provide a Technical Solution to the Technical Problem Even Without “Static”

The claims of the ’411/’996 patents solve the technical problem with prior art trading tools with a technical solution even without the “static” limitation. As *IBG* pointed out, one conventional graphical user interface (“GUI”) for trading is shown in Figure 2 of the specification. *IBG*, 757 F. App’x at 1007; Appx66558-66560; Appx66566; Appx66563. As explained above, this Figure 2-style GUI displayed the inside market (best bid price/best ask price) in a fixed location and users entered orders by clicking directly on a displayed price in a cell. Appx66558-66560; Appx82201-82205. Because the location of the inside market was fixed on the screen, as the market changed, the prices associated with the inside market would change or “flip” each and every time the market changed. Appx66563-66565; *see also* *IBG*, 757 F. App’x at 1007. The user had no way of knowing when this market change would occur. As *IBG* explained, this was a “technical problem” with this type of prior GUI. 757 F. App’x at 1007 (alteration omitted). In this prior art GUI, the prices changed or “flipped” every time there was a change in the market, and thus if a user clicked to enter an order at the moment of any one of these unpredictable market changes, she would not get her intended price. *Id.*; Appx66563-66565.

This is not the case with the '411/'996 patents—the prices do not change positions every time there is a change in the market. As shown in Figures 3 and 4 of the specification above in Section I of the Statement of the Case and Facts, when there is a market change reflected by the inside market moving upwards, the prices did not change positions or “flip” in the price cells, thereby creating an improved GUI tool as compared to Figure 2. Appx66575-66576; Appx82222-82225. *IBG* correctly recognized and understood that the claims of the '411/'996 provide this improvement over the Figure 2-style GUI by “displaying market depth on a vertical or horizontal plane, which fluctuates logically up or down, left or right across the plane as the market fluctuates.” 757 F. App’x at 1007 (internal quotes omitted) (quoting '132 patent at 6:65-7:2). Of course, the only way to see the market fluctuating “logically up or down” is if the inside market moves relative to prices that do not move, which is the case in both the '411/'996 patents and the '132/'304 patents. Again, this improved the accuracy over the Figure 2-style GUI where the prices would change positions or “flip” every time the market changed, and thus no relative movement was provided.

The district court’s view that only a “static” price axis that never moves (unless moved manually) can provide an improvement to the Figure 2-style screen was wrong. Again, in the Figure 2-style screen, the prices change positions every time the market changes. The '132/'304 patents improve over this by ensuring that

the prices do not change positions every time the market changes. Instead, in the '132/'304 patents, when the market changes (by moving upwards for example), the prices do not change positions. The same is true with the '411/'996 patents—the prices do not change positions every time the market changes. Rather, when the market moves upward (for example), the prices do not change position. In other words, in order to provide a GUI having market data that “fluctuates logically up or down” as set forth in the '411/'996 patent claims as well as the '132/'304 patent claims, the price axis is not moving each and every time the market changes like in the Figure-2 style screen. Thus, in the '411/'996 patents as well as the '132/'304 patents, the price axis is being kept still as compared to the Figure 2-style screen. Both sets of patents are improvements to the accuracy problem in the Figure 2-style screen and therefore both sets of patents are eligible under § 101.³

The claims of the '411/'996 patents also solved the lack of visualization problem of the Figure 2-style screens. Appx66577; Appx3038. As this Court has acknowledged repeatedly, the movement of the indicators of the inside market along a price axis (relative movement) provides visualization improvements over the prior art like Figure 2, in which there is no relative movement and thus no

³ The slight difference between the '132/'304 patents' solution (a static price axis with relative movement) versus the '411/'996 patents' solution (price axis with relative movement) may be relevant to infringement, but not the threshold patent eligibility question under § 101.

visualization of market movements. *OEC*, 728 F.3d at 1313-14; *eSpeed*, 595 F.3d at 1347.

D. The District Erred by Relying on Different Cases Involving Different Patents Not at Issue Here

Instead of relying on *IBG*—the only case from this Court that actually considered whether the ’411/’996 patents are technological inventions—the district court veered off course and looked at other § 101 decisions involving different, unasserted patents. Appx92822. Then, with barely any analysis whatsoever, and without any claim construction being performed by any court with respect to these unasserted patents, the district court baldly concluded that the claims in the unasserted patents are “nearly identical” to the claims of the ’411/’996 patents.

The first of the unasserted patents, the ’382 patent, was invalidated in a decision under Rule 36 of the Federal Circuit Rules and therefore contained no analysis of the claims of the ’382 patent whatsoever, or how those claims compared to the claims of the ’411/’996 patents. *Trading Techs. Int’l, Inc. v. IBG LLC*, 771 F. App’x 493 (Fed. Cir. 2019).

Likewise, in the decision involving the second unasserted patent, the ’768 patent, this Court found, in a single paragraph, that the ’768 patent was ineligible because the patent claims focused “on improving the trader, not the functioning of the computer.” *Trading Techs. Int’l, Inc. v. IBG LLC*, 767 F. App’x 1006, 1007 (Fed. Cir. 2019) (quotations omitted). But with respect to the patents at issue

here—the ’411/’996 patents—this Court in *IBG* already found that these patents *do* improve the functioning of the computer. 757 F. App’x at 1007-08 (agreeing that the “the claimed subject matter is directed to a specific improvement to the way computers operate” (quotations omitted)). Thus, the decision involving the ’768 patent is not relevant.

E. The District Court Erred in Concluding That the ’411 and ’996 Patents Do Not Pass Step Two Under *Alice*

Here, the district court found that the ’411/’996 “invention[s] merely claim[] a rearrangement of market information known to be displayed in a different format” and that the claimed rearrangement “is not innovative in that it solves a technical problem.” Appx92823. This was error, as demonstrated above. Again, this Court has already found in *IBG* that the claims of the ’411/’996 patents solve a technical problem with conventional Figure 2-style GUIs. 757 F. App’x at 1007. And yet again, the district court wrongly found that the inventive concept was a “static” price axis, which is not the case. Appx92823. The inventive concept of the ’411/’996 patents is the movement of the market (up and down) along a price axis (combined with single action order entry) that improves over the conventional Figure 2-style GUI in which there is no such relative movement because the prices in the best bid/best ask cells change (or “flip”) every time there is a change in the inside market. Cf. *IBG*, 757 F. App’x at 1007. Indeed, this Court’s finding in *IBG*—that the claimed invention solves a technical problem with a technical

solution—should be dispositive on step two. *Amdocs (Israel) Ltd. v. Openet Telecom, Inc.*, 841 F.3d 1288, 1300 (Fed. Cir. 2016) (finding claims eligible under step two where they were directed to an “unconventional technological solution . . . to a technological problem”).

The district court also erred on the step two analysis for one additional and important reason. As this Court has made clear, “whether a claim element or combination of elements is well-understood, routine and conventional to a skilled artisan in the relevant field is a question of fact,” one that must be proven by “clear and convincing evidence.” *Berkheimer v. HP Inc.*, 881 F.3d 1360, 1368 (Fed. Cir. 2018). Yet, on summary judgment before the district court, TT presented overwhelming evidence that the claims of the ’411/’996 patents were far from “well understood, routine and conventional” to a person skilled in the relevant field. Appx66492-66499; *see supra* Section I of the Statement of the Case and Facts. The district court’s opinion does not even mention, let alone address, whether the ’411/’996 patent claims were well-understood, routine and conventional to a skilled artisan. Nor does it mention TT’s mass of evidence, including expert testimony, that shows the claims were *not* well-understood, routine and conventional. At the summary judgment stage, where there was clearly a material issue of fact presented, the district court erred by overlooking

this evidence, and granting judgment in IB’s favor. *Berkheimer*, 881 F.3d at 1370 (finding “summary judgment inappropriate”). This Court should reverse.

II. THE DISTRICT COURT’S EXCLUSION OF FOREIGN DAMAGES MUST BE REVERSED UNDER *WESTERN GECO*

The district court erred as a matter of law by finding that TT cannot recover damages resulting from IB’s conduct abroad (“foreign damages”) that are the foreseeable result of IB’s domestic acts of infringement under Section 271 (a). Appx19; Appx87503 ; Appx87852-87853. This Court should reverse and remand for a new trial on damages.

The Supreme Court in *WesternGeco* was presented with the issue of whether patent owners may recover foreign damages under Sections 271(f)(2) and 284 of the Patent Act. *WesternGeco*, 138 S. Ct. at 2134. To answer this question, the Court evaluated “whether the case involves a domestic application,” by “identifying the statute’s focus and asking whether the conduct relevant to that focus occurred in United States territory.” *Id.* at 2136 (internal quotations omitted). The Court concluded that the focus of Section 284 is “the infringement,” and the focus of 271(f)(2) is “the act of exporting components from the United States.” *Id.* at 2138. Taken together, the Court found that the statutes have a domestic focus, and therefore, any foreign damages awarded under those statutes would be a permissible domestic application. *Id.* at 2137, 2139.

The Supreme Court’s holding in *WesternGeco* applies equally to Section 271(a). Specifically, the infringing conduct prohibited by Section 271(f)(2) in *WesternGeco* is analogous to the infringing conduct prohibited by Section 271(a). Like Section 271(f)(2), which prohibits exporting components “from the United States,” Section 271(a) prohibits making, using, offering to sell, or selling “within the United States.” 35 U.S.C. § 271. Indeed, this Court has previously found that the “express language” of Section 271(a) applies only to conduct within the United States. *E.g., Int’l Rectifier Corp. v. Samsung Elecs. Co.*, 361 F.3d 1355, 1360 (Fed. Cir. 2004). Accordingly, just like Section 271(f)(2), Section 271(a) has a domestic focus, and it too must allow for the recovery of foreign damages. *Cf. WesternGeco*, 138 S. Ct. at 2142 (Gorsuch, J., dissenting) (finding it would “invite anomalous results” to interpret 271(f)(2) differently from 271(a)); *WesternGeco L.L.C. v. ION Geophysical Corp.*, 791 F.3d 1340, 1351 (Fed. Cir. 2015) (finding infringement provisions must be interpreted consistently), *judgment vacated sub nom. WesternGeco LLC. v. ION Geophysical Corp.*, 579 U.S. 915 (2016).

Various courts have agreed that the reasoning of *WesternGeco* applies to Section 271(a). As Circuit Judge Stark explained during his prior tenure in the District of Delaware:

The Supreme Court’s analysis of the patent damages statute, § 284, has equal applicability to the direct infringement allegations pending here, as governed by § 271(a), as it did to the supplying a component

infringement claims at issue in *WesternGeco II*, which were governed by § 271(f)(2). [Defendant] has identified no persuasive reason to conclude that the interpretation of § 284 should differ here from what was available in *WesternGeco II* just because the type of infringing conduct alleged is different. Instead, as [plaintiff] puts it, “Section 271(a) ‘vindicates domestic interests’ no less than Section 271(f).”

Power Integrations, Inc. v. Fairchild Semiconductor Int'l, Inc., No. 04-1371-LPS, 2018 WL 4804685, at *1 (D. Del. Oct. 4, 2018); *see also Plastronics Socket Partners, Ltd. v. Dong Weon Hwang*, No. 2:18-CV-00014-JRG-RSP, 2019 WL 4392525, at *4-5 (E.D. Tex. June 11, 2019); *W.H. Wall Fam. Holdings LLLP v. CeloNova Biosciences Inc.*, No. 1:18-CV-303-LY, 2020 WL 1644003, at *3 (E.D. Tex. April 2, 2020); *SIMO Holdings Inc. v. Hong Kong uCloudlink Network Tech. Ltd.*, 396 F. Supp. 3d 323, 350-51 (S.D.N.Y. 2019); *ABS Global, Inc. v. Inguran, LLC*, No. 14-cv-503-wmc, 2020 WL 2405380, at *8-9 (W.D. Wis. May 12, 2020).

This Court should apply the same reasoning and find that foreseeable foreign damages are permissible under Section 271(a).

The district court’s reliance on *Power Integrations*, which had previously held that foreign damages were not compensable under Section 271(a), does not counsel otherwise. Specifically, while the district court found that “[t]he Supreme Court and Federal Circuit have not yet held that *WesternGeco* overruled *PowerIntegrations*,” Appx19, the district court did not need an express ruling in order to reach that conclusion. *Troy v. Samson Mfg. Corp.*, 758 F.3d 1322, 1326

(Fed. Cir. 2014) (“[T]he issues decided by the higher court need not be identical to be controlling. Rather, the relevant court of last resort must have undercut the theory or reasoning underlying the prior circuit precedent in such a way that the cases are clearly irreconcilable.” (internal quotations omitted)); *California Inst. of Tech. v. Broadcom Ltd.*, 25 F.4th 976, 991 (Fed. Cir. 2022) (finding Supreme Court did not “explicitly overrule” prior precedent but undermined the reasoning).

As explained above, the Supreme Court’s reasoning in *WesternGeco* clearly undercuts the *Power Integrations* court’s theory that foreign damages are not compensable. Compare *Power Integrations, Inc. v. Fairchild Semiconductor Int’l, Inc.*, 711 F.3d 1348, 1371 (Fed. Cir. 2013) (“Power Integrations is incorrect that, having established one or more acts of direct infringement in the United States, it may recover damages for Fairchild’s worldwide sales . . .”), with *WesternGeco*, 138 S. Ct. at 2138 (“[I]t was ION’s domestic act of supplying the components that infringed WesternGeco’s patents. Thus, the lost-profits damages that were awarded to WesternGeco were a domestic application of § 284.”). That was enough for the district court to find that foreign damages may be awarded in this case. *Power Integrations*, 2018 WL 4804685, at *1 & n.2 (Stark, J.) (“In the Court’s view, the Supreme Court’s *WesternGeco II* decision implicitly overruled the Federal Circuit’s *Power Integrations* opinion.”). Because the district court refused to make such a finding, this Court should reverse and remand for a new trial on damages.

III. THE DISTRICT COURT ABUSED ITS DISCRETION BY DENYING PLAINTIFF'S MOTION FOR "A NEW TRIAL ON DAMAGES AND RELATED REQUESTS ALL BASED ON A FINDING OF AN ATTEMPT TO COMMIT FRAUD BY DEFENDANT".

A. In This Case, IB Had Always Represented That It Was "Solely Tracking Orders And Trades In TWS By What Tools The Orders Are Submitted From." On November 9, 2021, When IB Replied To Our Motion For "A New Trial On Damages, Etc.", It Was Forced To Admit That There Are Tools Being Attributing Orders And Trades That Are Not Capable Of Submitting Orders.

Up until November 9, 2021, when IB replied to our motion for "a new trial on damages, etc.", IB had always represented that it was "solely tracking orders and trades in TWS by what tools the orders are submitted from." For instance, Mr. Galik testified explicitly on this matter at trial. Appx101353-101356; *citing* Appx133373.

Then at trial, for the first time, Mr. Galik presented the order entry tools that were available in TWS in 2006, 2009, and 2013. Appx133373. There were 38 order entry tools listed in 2013.

Then at trial, for the first time, Mr. Stetsenko testified that IB was tracking commissions by trading tools, and not by order entry tools. Appx101776.

Analyzing "Galik's 38 Order Entry Tools from 2013"							
#	Stat Report Beg	Stat Report End	TWS Tool	Can Submit Orders	Cannot Submit Orders	Both	Notes
1	9/2008	4/2019	Accumulate/Distribute	<input checked="" type="checkbox"/>			
2	12/2011	4/2019	ActivityMonitor	<input checked="" type="checkbox"/>			
3	2/2012	4/2019	AggBook (aka Market Depth)	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		
4	9/2008	4/2019	Alert	<input checked="" type="checkbox"/>			
5	6/2008	4/2019	Basket	<input checked="" type="checkbox"/>			
6	6/2008	4/2019	Blotter	<input checked="" type="checkbox"/>			
7	6/2008	4/2019	BookTrader	<input checked="" type="checkbox"/>			
8	4/2010	10/2014	CTT				
9	6/2008	4/2019	ChartTrader	<input checked="" type="checkbox"/>			
10	6/2008	4/2019	Close	<input checked="" type="checkbox"/>			
11	6/2008	4/2019	DynamicVol	<input checked="" type="checkbox"/>			
12	6/2008	4/2019	FxTrader	<input checked="" type="checkbox"/>			
13	10/2009	4/2019	ISW	<input checked="" type="checkbox"/>			
14	3/2012	4/2019	Investment				
15	12/2011	9/2014	MT3G				
16	12/2011	9/2014	Mtrader				
17	8/2010	4/2019	MainWin	<input checked="" type="checkbox"/>			
18	6/2008	4/2019	MktDepth (Trader)	<input checked="" type="checkbox"/>			
19	6/2008	4/2019	OptTrader	<input checked="" type="checkbox"/>			
20	11/2011	4/2019	OptTraderComboPanel	<input checked="" type="checkbox"/>			
21	1/2012	4/2019	OptionChain				
22	3/2011	4/2019	OptionExercise	<input checked="" type="checkbox"/>			
23	10/2010	4/2019	OptionRoll	<input checked="" type="checkbox"/>			
24	10/2010	4/2019	OptionWrite	<input checked="" type="checkbox"/>			
25	12/2011	4/2019	OrderEntry	<input checked="" type="checkbox"/>			
26	6/2008	4/2019	OrderTicket	<input checked="" type="checkbox"/>			
27	11/2008	11/2017	OrderWizard	<input checked="" type="checkbox"/>			
28	6/2010	4/2019	Portfolio				
29	6/2008	4/2019	PlainVanilla	<input checked="" type="checkbox"/>			
30	6/2008	4/2019	RapidEntry	<input checked="" type="checkbox"/>			
31	6/2008	4/2019	Rebalance	<input checked="" type="checkbox"/>			
32	9/2009	4/2019	SBLPage				
33	6/2008	4/2019	Scale	<input checked="" type="checkbox"/>			
34	11/2010	4/2019	Scanner				
35	6/2008	4/2019	Socket (aka TWS API)	<input checked="" type="checkbox"/>			
36	6/2008	4/2019	SpreadTrader	<input checked="" type="checkbox"/>			
37	11/2008	4/2019	TimeAndSales				
38	1/2012	4/2019	WatchList		<input checked="" type="checkbox"/>		

Table: Analyzing Galik's 38 Order Entry Tools from 2013 (compiled by data in Appx105512-132652).

After the trial, we thoroughly analyzed for a week Mr. Galik's list of "38 order entry tools available in TWS from 2013." We determined that 27 tools can submit orders, 5 tools cannot submit orders, 2 tools can submit orders in Classic and cannot submit orders in Mosaic, and we could not find 4 tools. *See Table above.* Yet, when we checked the "discovery stats reports", all 38 tools were receiving credit for orders and trades.

On November 9, 2021, IB attached a declaration from Mr. Stetsenko to its opposition brief. In paragraph 22 of Mr. Stetsenko's declaration, he is forced to

admit that there are tools being attributed orders and trades that are not capable of submitting orders. Appx98646-98647.

B. There Has To Be A Major Shift Away From “Tracking Orders And Trades By What Tools The Orders Are Submitted From” To Reconcile “An Enormous Discrepancy Between Accumulate/Distribute (1 Of Mr. Galik’s “38 Order Entry Tools From 2013”) And Its Trade Volume.” Therefore, With This Major Shift, IB Has Grossly Misrepresented The BookTrader Data To Be Something That It Is Not.

Now that we know IB is not “solely tracking orders and trades by what tools the orders are submitted from”, how are they tracking orders and trades?

We turn to Accumulate/Distribute:

- Mr. Peterffy has testified over the course of his deposition and the trial that Accumulate/Distribute is IB’s best, most advanced, most valuable, and arguably most important tool. Appx98670-98675; Appx98732-98734; Appx101170-101171.
- Accumulate/Distribute is an algo and it is strictly used to submit orders, so when Mr. Peterffy talks about its great value, it is strictly in the context of submitting orders.
- Yet when we check the 550+ “discovery stats reports”, they reportedly show that Accumulate/Distribute was only responsible for submitting .08% of the trades in TWS from June 2008–April 2019 (i.e., 1 in every 1250 trades). Mr. Stetsenko confirmed this virtually nonexistent trade volume for

Accumulate/Distribute in paragraph 24 of his declaration on November 9, 2021. Appx98634-98649.

- This “enormous discrepancy between Accumulate/Distribute and its trade volume” demonstrates the lack of correlation between “how IB is tracking orders and trades” and “tracking orders and trades by what tools the orders are submitted from.”
- “However IB is tracking orders and trades”, there has to be a major shift away from “tracking orders and trades by what tools the orders are submitted from” to reconcile this “enormous discrepancy between Accumulate/Distribute and its trade volume.”

Therefore, with this major shift, IB has grossly misrepresented the BookTrader data to be something that it is not. To this end, IB was very strategic in faking and relentlessly hammering that BookTrader was merely responsible for submitting 3-5% of the trades through TWS at trial. This serves to belittle the invention and limit its value. This in turn serves to limit the per trade royalty rate, prevent a monthly minimum royalty rate, limit any monthly minimum royalty rate, and limit how broadly any monthly minimum is applied across those receiving TWS. All of this worked to perfection with the jury. Altogether, with the proper usage of BookTrader, the difference in damages could be 100+ times.

C. Also, As A Bonus, We Strongly Believe That We Know “How IB Is Tracking Orders And Trades”, Which Is “By What Tools Set The Symbols For Orders”.

The evidence strongly suggests that IB is “tracking orders and trades by what tools set the symbols for orders” for the following reasons:

- Setting the symbol is the foundational element of all orders.
- The term “order originator” fits very well with “the tools that set the symbols for orders.” Setting the symbol originates the foundational element of an order.
- “Tracking orders and trades by what tools set the symbols for orders” is legitimate business intelligence.
- The virtually nonexistent trade volume of Accumulate/Distribute can be reconciled.

Setting the symbols for orders works as follows in TWS:

- An order requires many different parameters, including symbol, order type, buy or sell, price, quantity, and duration to be set in the tool that submits the order to the exchange.
- A symbol represents the desired stock, option contract, future contract, etc. that is being traded. For example, to trade Apple stock, the order must identify the symbol for Apple stock, which is AAPL.

- The quickest and most efficient way to set the symbols for orders is via a prominent feature in TWS called “grouped tools.” IB’s website includes a video demonstrating how “grouped tools” works in Mosaic. As demonstrated in this video, the grouped tools all initially display the Apple stock symbol (AAPL). Next, the user selects the IBKR symbol in the tool labeled “Monitor” (which is actually “Watchlist”) in the middle right of the screen, and immediately, this sets the IBKR symbol for an order in each of the grouped tools, and these tools all display data associated with the IBKR symbol.
- “Grouped tools” is all about leveraging existing symbols in the grouped tools to quickly and efficiently both “set symbols for orders” and “display data associated with these symbols” across the grouped tools.

The tools that are quotation boards will be dominant in “tracking orders and trades by what tools set the symbols for orders”:

- Quotation boards like Main Window, Watchlist, and Portfolio are staple tools and the center of virtually all trading platforms.
- Main Window, Watchlist, and Portfolio consist of grids that display many rows of symbols and their respective market information. Portfolio includes a focus on symbols of current and previous trading positions.

- Main Window, Watchlist, and Portfolio, being quotation boards of many symbols, are naturally the center of setting the symbols for orders in TWS. Assuming IB is “tracking orders and trades by what tools set the symbols for orders”, the percentage of trades that IB has attributed to BookTrader is irrelevant in the sense of how many trades are being submitted from BookTrader. Nearly all tools, including the quotation boards, can set symbols in BookTrader, and vice versa to a large extent. BookTrader could theoretically be responsible for submitting anywhere from 0% to nearly 100% of all trades.

D. The District Court’s Denial Opinion Of Plaintiff’s Motion For “A New Trial On Damages And Related Requests All Based On A Finding Of An Attempt To Commit Fraud By IB” Has Several Errors, Including Two Critical Errors. Therefore, Its Conclusion Is Wrong, And The District Court Has Abused Its Discretion.

The District Court cited the following in supporting its denial of plaintiff’s motion for “a new trial on damages, etc.”. Appx36-37 *citing* Appx103276-103281.

Plaintiff’s response:

The District Court makes a critical error in holding the plaintiff to question and investigate whether IB may not “track orders and trades by what tools submit the orders” prior to trial. None of us, the attorneys, the trading domain folks, or anyone else, had ever heard of or imagined another way of tracking orders and trades. “Tracking orders and trades by what tools submit the orders” was considered only logical and a given. Nothing else ever remotely crossed our

minds. We were concerned that IB may be somehow altering BookTrader data in a vacuum, but that is an entirely different thing from tracking orders and trades by another method.

The District Court is incorrect that the “38 order entry tools available in TWS from 2013” were identified by IB prior to trial. Mr. Galik presented this list of “order entry tools” for the first time at trial. Appx101601-101603; *citing* Appx133374.

The District Court is incorrect that Mr. Brumfield had access to the “discovery stats reports” and “Mr. Peterffy’s deposition testimony regarding Accumulate/Distribute” prior to trial. The vast majority of what IB produced in discovery, including these matters fell under the protective order in this case, which prevented Mr. Brumfield from accessing this information. Appx116269-116323; Appx98670-98675. Mr. Brumfield was ultimately able to access the “discovery stats reports” when they were admitted into evidence and became public at trial (we note that Mr. Brumfield previously knew of the trade volume that was attributed to BookTrader from settlement talks). Mr. Brumfield was ultimately able to access “Mr. Peterffy’s deposition testimony regarding Accumulate/Distribute”, when we petitioned the District Court in this matter specifically for Mr. Brumfield, and the District Court ultimately de-designated this testimony on 1/13/22. Appx133435-133436.

The District Court is incorrect that plaintiff failed to analyze the Blotter code to determine potential discrepancies in IB's transaction data. We analyzed the Blotter code and then questioned Mr. Stetsenko at trial for nearly thirteen minutes in this regard. Appx101794-101803 (Stetsenko Trial Transcript) *citing* Appx101794-101803; Appx95207; Appx133438-133439.

The District Court further cited the following in supporting its denial of plaintiff's motion for "a new trial on damages, etc.". Appx39-40.

Plaintiff's response:

The District Court makes a critical error in assuming, for orders submitted through tools in Mr. Stetsenko's first category of tools, that the originating tool and the submitting tool are necessarily the same tool. We are not sure, but maybe the District Court misinterpreted Mr. Stetsenko's statement about the first category of tools being "self-contained (i.e., they have their own order entry mechanism)." In this context, "self-contained" means "having everything necessary to work independently." This meaning is effectively cited by nearly all of the online dictionaries. This does not mandate, for orders submitted through tools in Mr. Stetsenko's first category of tools, that the originating tool and the submitting tool be the same tool. However the District Court makes this assumption, it is not the case. Accumulate/Distribute is in Mr. Stetsenko's first category of tools and there is the "enormous discrepancy between Accumulate/Distribute and its trade

volume.” The only way to reconcile this enormous discrepancy is, for orders submitted through tools in Mr. Stetsenko’s first category of tools, the originating tool and the submitting tool may be different tools.

The District Court claims that Mr. Brumfield acknowledges this assumption in paragraph 10 of his 2nd declaration. This is incorrect. The operative word in Mr. Brumfield’s statement is “can.” In fact, the main point of the next several paragraphs in his declaration is, for orders submitted through tools in Mr. Stetsenko’s first category of tools, the originating tool and the submitting tool are usually different tools. Appx103657-103659.

In plaintiff’s reply brief, it is made clear that, for orders submitted through tools in Mr. Stetsenko’s first category of tools, the originating tool and the submitting tool “may be entirely different.” It is also made clear that Mr. Brumfield’s 2nd declaration is in step with this. Appx103484.

It is clear in the District Court’s Denial Opinion that it thought the plaintiff was in the dark about the virtually nonexistent trade volume attributed to Accumulate/Distribute until post-trial. Appx36-37.

For the record, early in the trial, we saw from one of the "made-for-presentation stats reports" for the week of March 24-28, 2014, that Accumulate/Distribute accounted for only .1% of the trade volume across all "order originators" for that week. Appx133437. We then had our data analyst do

an analysis of Accumulate/Distribute and its trade volume across the 550+ “discovery stats reports” that span from June 2008–April 2019. We learned the night before Mr. Peterffy was to testify that the results of this analysis were roughly in line with the week of March 24-28, 2014.

Mr. Peterffy’s deposition testimony regarding Accumulate/Distribute and its great value to IB was in a different stratosphere from the virtually nonexistent trade volume attributed to Accumulate/Distribute. We thought there had to be an explanation for the “enormous conflict between Accumulate/Distribute and its trade volume.” We did complain a lot about the data at trial, and we were concerned that IB may be somehow altering BookTrader data in a vacuum, but we did not think the data as a whole was irrelevant. IB had been distributing 550+ stats reports on a weekly basis from June 2008—April 2019 to senior management (including Mr. Peterffy, Mr. Galik, and Mr. Stetsenko), and software engineers involved in the development of TWS. We knew from emails produced in discovery that IB was building software based on this intelligence, and we did not think that they were duping their own business.

Therefore, we did not want to unnecessarily elevate Accumulate/Distribute and diminish BookTrader in front of the jury. We thought giving IB airtime to detail and rectify the “enormous conflict between Accumulate Distribute and its trade volume” would do this. The reason we asked Mr. Peterffy about

Accumulate/Distribute at trial was to establish its importance. We were going to introduce the “enormous conflict between Accumulate/Distribute and its trade volume” in our closing argument, where IB would be limited in responding, to cast doubt on IB and its data. We ultimately decided that was not a good idea.

Everything changed post-trial when we contemplated the combination of 1) IB always representing that they were "solely tracking orders and trades by what tools submit the orders", 2) Mr. Galik labeling his "38 tools from 2013" as "order entry tools", 3) Mr. Stetsenko's "tracking commissions by trading tools, not order entry tools", 4) the analysis of Mr. Galik's "38 order entry tools from 2013", and 5) the enormous conflict between Accumulate/Distribute and its trade volume (see Sections III.A & III.B of the Argument). This combination screamed cover-up. We went from "there had to be an explanation for the enormous conflict between Accumulate/Distribute and its trade volume" to "there was no explanation for the enormous discrepancy between Accumulate/Distribute and its trade volume."

The circumstances at trial and post-trial were dramatically different. Therefore, us not pursuing “the enormous conflict between Accumulate/Distribute and its trade volume” at trial should not preclude us from pursuing the “enormous discrepancy between Accumulate/Distribute and its trade volume” post-trial.

E. Plaintiff Is Requesting “A Requests All Based On Damages And Related Requests All Based On A Finding Of An Attempt To Commit Fraud By IB”.

1. We are requesting “a new trial on damages” based on the following:

- In this case, IB had always represented that it was “solely tracking orders and trades in TWS by what tools the orders are submitted from.” On November 9, 2021, when IB replied to our motion for “a new trial on damages, etc.”, it was forced to admit that there are tools being attributed orders and trades that are not capable of submitting orders.
- There has to be a major shift away from “tracking orders and trades by what tools the orders are submitted from” to reconcile the “enormous discrepancy between Accumulate/Distribute and its trade volume.” Therefore, with this major shift, IB has grossly misrepresented the BookTrader data to be something that it is not.
- Also, as a bonus, we strongly believe that we know “how IB is tracking orders and trades”, which is “by what tools set the symbols for orders.”
- The District Court’s Denial Opinion regarding plaintiff’s motion for “a new trial on damages and related requests all based on a finding of an attempt to commit fraud by IB” has several errors, including two critical errors. Therefore, its conclusion is wrong, and the District Court has abused its discretion.

- This is all clear and convincing evidence that IB has attempted to commit fraud.

2. In conjunction with “a new trial on damages”, we are requesting the following:

- Full damages discovery, including the depositions of Mr. Peterffy, Mr. Galik, and Mr. Stetsenko.
- The freedom to share the “Appellate Court’s ruling” and “all that occurred with IB’s attempt to commit fraud” with the jury at “the new trial on damages.”

We make these requests for the following reasons:

- We should be able to start over completely and remake our damages case and refile.
- The evidence around the damages has changed dramatically. It certainly appears “IB attempted to commit fraud” because there was a lot to hide with respect to BookTrader and its trade volume.
- Plaintiff was exposed to tremendous risk by IB. Plaintiff spent significantly chasing IB’s deception over the years and was fortunate to catch IB and gather the evidence before time expired. Otherwise, Plaintiff would be facing a major loser and less than 1% of the potential damages.

3. We are requesting that “the granting of a new trial on damages and related requests” be based on “a finding

that IB has attempted to commit fraud” for the following reason:

- We do not want any ambiguity when it comes to what has happened here. As alluded to in the last paragraph, such clarity is critical in establishing IB as having a lot to hide with respect to BookTrader and its trade volume.

CONCLUSION AND STATEMENT OF RELIEF SOUGHT

The '411/'996 patents solve the technical problem in the patent specification with a technical solution and therefore are patent eligible under § 101. As such, this Court should reverse the district court's conclusion that the '411/'996 patents are ineligible and remand for a new trial that includes the '411/'996 patents and the IB products accused of infringing these patents. Moreover, because the district court erred as a matter of law by finding that TT cannot recover damages resulting from IB's conduct abroad ("foreign damages") that are the foreseeable result of IB's domestic acts of infringement under Section 271 (a), this Court should reverse and remand with an instruction to the district court that the Brumfield Trustee can recover foreign damages in the damages phases of the new trial.

Finally, because the district court abused its discretion by not granting TT a new trial based on IB's litigation misconduct, this Court should reverse and remand with the following instruction to the district court for the damages phase of the new trial:

- TT shall be entitled to damages discovery, including the depositions of Mr. Peterffy, Mr. Galik, and Mr. Stetsenko, and TT shall be entitled to submit new experts report prior to the new trial.

Date: August 26, 2022

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FORM 19. Certificate of Compliance with Type-Volume Limitations

Form 19
July 2020UNITED STATES COURT OF APPEALS
FOR THE FEDERAL CIRCUITCERTIFICATE OF COMPLIANCE WITH TYPE-VOLUME LIMITATIONSCase Number: 22-1630, -1639Short Case Caption: Harris Brumfield, Trustee for Ascent Trust v. IBG LLC

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- the filing has been prepared using a monospaced typeface and includes _____ lines of text.
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Date: 08/26/2022Signature: /s/ Jennifer M. KurczName: Jennifer M. Kurcz

ADDENDUM

**IN THE UNITED STATES DISTRICT COURT
FOR THE
NORTHERN DISTRICT OF ILLINOIS**

Trading Technologies International, Inc.,

Plaintiff,

v.

IBG LCC and Interactive Brokers, LLC.,

Defendant(s).

Case No. 10-cv-715
Judge Virginia M. Kendall

JUDGMENT IN A CIVIL CASE

Judgment is hereby entered (check appropriate box):

in favor of plaintiff(s) Trading Technologies International, Inc.
and against defendant(s) IBG LCC and Interactive Brokers, LLC.
in the amount of \$6,610,985.00 ,

which includes pre-judgment interest.
 does not include pre-judgment interest.

Post-judgment interest accrues on that amount at the rate provided by law from the date of this judgment.

Plaintiff(s) shall recover costs from defendant(s).

in favor of defendant(s)
and against plaintiff(s)

Defendant(s) shall recover costs from plaintiff(s).

other:

This action was (*check one*):

tried by a jury with Judge Virginia M. Kendall presiding, and the jury has rendered a verdict.
 tried by Judge without a jury and the above decision was reached.
 decided by Judge on a motion

Date: 9/7/2021

Thomas G. Bruton, Clerk of Court

Alberta Rone , Deputy Clerk

**UNITED STATES DISTRICT COURT
FOR THE Northern District of Illinois – CM/ECF LIVE, Ver 6.3.3
Eastern Division**

Trading Technologies International, Inc.

Plaintiff,

v.

Case No.: 1:10-cv-00715

Honorable Virginia M. Kendall

BCG Partners, Inc., et al.

Defendant.

NOTIFICATION OF DOCKET ENTRY

This docket entry was made by the Clerk on Tuesday, January 11, 2022:

MINUTE entry before the Honorable Virginia M. Kendall. Pursuant to this Court's order [2214], the judgment is amended to include an award of prejudgment interest on the Jury award of \$6,610,985 at a rate of 4.413% beginning in July 2004 through January 11, 2022, compounded monthly, for a total of \$2,122,355. The judgment is also amended to include an award of post-judgment interest on the Jury award at a rate of 0.07% beginning on September 7, 2021, compounded annually. Post-judgment interest on the prejudgment interest is also awarded beginning on January 11, 2022 at a rate of 0.41%, compounded annually. Mailed notice(lk,)

ATTENTION: This notice is being sent pursuant to Rule 77(d) of the Federal Rules of Civil Procedure or Rule 49(c) of the Federal Rules of Criminal Procedure. It was generated by CM/ECF, the automated docketing system used to maintain the civil and criminal dockets of this District. If a minute order or other document is enclosed, please refer to it for additional information.

For scheduled events, motion practices, recent opinions and other information, visit our web site at www.ilnd.uscourts.gov.

**IN THE UNITED STATES DISTRICT COURT
NORTHERN DISTRICT OF ILLINOIS
EASTERN DIVISION**

TRADING TECHNOLOGIES)
INTERNATIONAL, INC.,)
<i>Plaintiff</i>)
	No. 10 C 715
v.)
	Judge Virginia M. Kendall
IBG, LLC, et al.)
<i>Defendants.</i>)

MEMORANDUM OPINION AND ORDER

Plaintiff Trading Technologies (“TT”) brought this action to recover damages caused by Defendant IBG’s alleged infringement of four TT patents: the ‘132, ‘304, ‘411, and ‘996 Patents. Before the Court are the parties’ cross motions for summary judgment regarding patent eligibility. TT moves for summary judgment that the patents in suit are patent eligible as a matter of law [1359]. IBG moves for summary judgment that the ‘411 and ‘996 Patents are patent ineligible [1387]. For the following reasons, TT’s motion is granted in part and denied in part and IBG’s motion is granted.

BACKGROUND

I. Patent Claims

The patents at issue are part of the same patent family, share a common patent specification, and are “directed to the electronic trading of commodities.” (Dkt. 1119 at Ex. C) (Dkt. 1120 at Ex. Q, Ex. S, Ex. U).¹ They recite “[a] method and system for reducing the time it takes for a trader

¹ While the Court would normally rely on the parties’ Rule 56.1 Statements of Material Fact on a motion for summary judgment, the Court declines to heavily rely on them in this matter—quite simply they are not useful. Nearly every statement is disputed without regard to whether the basis for dispute affects the outcome of the present motions. Instead, the Court relies on the underlying evidence itself to glean the material facts.

to place a trade when electronically trading on an exchange, thus increasing the likelihood that the trader will have orders filled at desirable prices and quantities.” (*Id.*) Specifically, the patents claim a graphical user interface (“GUI”) “displaying market depth on a vertical or horizontal plane, which fluctuates logically up or down, left or right across the plane as the market price fluctuates” and “a static display of prices corresponding to the plurality of bids and asks.” (*Id.*) The “pluralities of bids and asks are dynamically displayed in alignment with the prices corresponding thereto.” (*Id.*) “This allows the trader to trade quickly and efficiently.” (*Id.*) The invention disclosed by the patents “can be implemented on any existing or future terminal or device” and “[t]he physical mapping of [the] information to a screen grid can be done by any technique known to those skilled in the art.” (*Id.*) (“The invention is not limited by the method used to map the data to the screen display.”).

The patents in suit disclose the following prior art GUI display:

FIG. 2

	Contract	Depth	BidQty	BidPrc	AskPrc	AskQty	LastPrc	LastQty	Total	
1	CDHO	•	785	7626	7627	21	7627	489	8230	
2			626	7625	7629	815				
3			500	7624	7630	600				
4			500	7623	7631	2456				
5			200	7622	7632	800				

(Dkt. 1119 at Ex. C) (Dkt. 1120 at Ex. Q, Ex. S, Ex. U). The grid depicts the inside market (highest ask and bid prices) and the market depth of a given commodity being traded. (*Id.*) (*Id.*) On a conventional trading screen like Figure 2, the fluctuation of market prices “results in rapid changes in the price and quantity fields within the market grid[,]” which creates a problem: “If a trader intends to enter an order at a particular price, but misses the price because the market

prices moved before he could enter the order, he may lose hundreds, thousands, even millions of dollars.” (*Id.*)

In contrast, the disclosed invention, as illustrated by Figure 3 below, displays bid and ask columns and inside market indicators (area 1020) that move relative to a static price axis, “increas[ing] the speed of trading and the likelihood of entering orders at desired prices with desired quantities.” (*Id.*)

FIG. 3

SYCOM FGBL DEC99					
E/W	10:48:44	BidQ	AskQ	Prc	LTQ
1009	L 3		104	99	
1010	R 5		24	98	
1011	720		33	97	
1012	X 10		115	96	
1013	0		32	95	
1014	10 1H		27	94	
	50 3H		63	93	
1007	S 0 W 24	1K 5H	45	92	
	S 0 W 7	CLR			
1015	X 10		28	91	
1016	17 ▽		20	90	10
1008	B 0 W 15	CXL	18	89	
	B 0 W 13	+ -	97	88	
1017	NET 0		30	87	
1018	B 0 W 17	NET REAL	43	86	
1019			110	85	
1021			23	84	
			31	83	
			125	82	
			21	81	
			1001	1002	1003
			1004	1005	1006
			1007	1008	1009
			1010	1011	1012
			1013	1014	1015
			1016	1017	1018
			1019	1020	1021

Despite the common specification language, the reference to “a static display of prices” denotes a slightly different scope with regards to the ‘132 and ‘304 Patents than to the ‘411 and ‘996 Patents. The ‘132 and ‘304 Patents recite a GUI with a static axis displaying prices that does not move when the inside market changes, unless by a manual re-centering or re-positioning command. (Dkt. 1119 at Ex. C) (Dkt. 1120 at Ex. Q) (Dkt. 1448 at ¶ 23). On the other hand, the

‘411 and ‘996 Patents encompass, but do not require, GUI’s with price axes that automatically recenter. (Dkt. 1527 at ¶¶ 14–15).

Representative claim one of the ‘411 Patent recites:

A method of displaying market information relating to and facilitating trading of a commodity being traded on an electronic exchange, the method comprising:

receiving, by a computing device, market information for a commodity from an electronic exchange, the market information comprising an inside market with a current highest bid price and a current lowest ask price;

displaying, via the computing device, a bid display region comprising a plurality of graphical locations, each graphical location in the bid display region corresponding to a different price level of a plurality of price levels along a price axis;

displaying, via the computing device, an ask display region comprising a plurality of graphical locations, each graphical location in the ask display region corresponding to a different price level of the plurality of price levels along the price axis;

dynamically displaying, via the computing device, a first indicator representing quantity associated with at least one trade order to buy the commodity at the current highest bid price in a first graphical location of the plurality of graphical locations in the bid display region, the first graphical location in the bid display region corresponding to a price level associated with the current highest bid price;

upon receipt of market information comprising a new highest bid price, moving the first indicator relative to the price axis to a second graphical location of the plurality of graphical locations in the bid display region, the second graphical location corresponding to a price level of the plurality of price levels associated with the new highest bid price, wherein the second graphical location is different from the first graphical location in the bid display region;

dynamically displaying, via the computing device, a second indicator representing quantity associated with at least one trade order to sell the commodity at the current lowest ask price in a first graphical location of the plurality of graphical locations in the ask display region, the first graphical location in the ask display region corresponding to a price level associated with the current lowest ask price;

upon receipt of market information comprising a new lowest ask price, moving the second indicator relative to the price axis to a second graphical location of the plurality of graphical locations in the ask display region, the second graphical location corresponding to a price level of the plurality of price levels associated with the new lowest ask price, wherein the second graphical location is different

from the first graphical location in the ask display region;

displaying, via the computing device, an order entry region comprising a plurality of graphical areas for receiving single action commands to set trade order prices and send trade orders, each graphical area corresponding to a different price level along the price axis;

and selecting a particular graphical area in the order entry region through a single action of the user input device to both set a price for the trade order and send the trade order having a default quantity to the electronic exchange.

(Dkt. 1120 at Ex. S).

Representative claim 1 of the '996 Patent recites:

A computer readable medium having program code recorded thereon for execution on a computer having a graphical user interface and a user input device, the program code causing a machine to perform the following method steps:

receiving market information for a commodity from an electronic exchange, the market information comprising an inside market with a current highest bid price and a current lowest ask price;

receiving an input from a user that designates a default quantity to be used for a plurality of trade orders;

dynamically displaying a first indicator in one of a plurality of locations in a bid display region, each location in the bid display region corresponding to a price level along a static price axis, the first indicator representing quantity associated with at least one order to buy the commodity at the current highest bid price;

dynamically displaying a second indicator in one of a plurality of locations in an ask display region, each location in the ask display region corresponding to a price level along the static price axis, the second indicator representing quantity associated with at least one order to sell the commodity at the current lowest ask price;

displaying the bid and ask display regions in relation to a plurality of price levels arranged along the static price axis such that when the inside market changes, the price levels along the static price axis do not change positions and at least one of the first and second indicators moves in the bid or ask display regions relative to the static price axis;

displaying an order entry region aligned with the static price axis comprising a plurality of areas for receiving commands from the user input device to send trade orders, each area corresponding to a price level of the static price axis;

and receiving a plurality of commands from a user, each command sending a trade order to the electronic exchange, each trade order having an order quantity based on the default quantity without the user designating the default quantity between commands, wherein each command results from selecting a particular area in the order entry region corresponding to a desired price level as part of a single action of the user input device with a pointer of the user input device positioned over the particular area to both set an order price parameter for the trade order based on the desired price level and send the trade order to the electronic exchange.

(*Id.* at Ex. U).

II. IBG's Prior Art Evidence

Prior to the patents in suit, specialists at the New York Stock Exchange (“NYSE”) maintained physical books with pre-printed vertical price columns and used them to plot, by hand, bid and ask quantities along the price column. (Dkt. 1527 at ¶ 33). By 1992, the NYSE implemented an electronic version of the specialist’s book called the “Display Book.” (*Id.* at ¶ 34). Another exchange, INTEX, also implemented a GUI modeling the specialist’s book. (*Id.* at ¶ 35). Pen-and-paper books, similar to the specialist’s book, were also used at the Tokyo Stock Exchange, which were then converted to an electronic version. (*Id.* at ¶¶ 37–38).

LEGAL STANDARD

Summary judgment is proper when “the movant shows that there is no genuine dispute as to any material fact and the movant is entitled to judgment as a matter of law.” Fed. R. Civ. P. 56(a); *see, e.g., Reed v. Columbia St. Mary’s Hosp.*, 915 F.3d 473, 485 (7th Cir. 2019). The parties genuinely dispute a material fact when “the evidence is such that a reasonable jury could return a verdict for the nonmoving party.” *Daugherty v. Page*, 906 F.3d 606, 609–10 (7th Cir. 2018) (citing *Anderson v. Liberty Lobby, Inc.*, 477 U.S. 242, 248 (1986)). In determining whether a genuine issue of material fact exists, the Court draws all reasonable inferences in favor of the party

opposing the motion. *Anderson*, 477 U.S. at 255; *Zander v. Orlich*, 907 F.3d 956, 959 (7th Cir. 2018).

DISCUSSION

Whether a concept is patent eligible is a question of law. *Berkheimer v. HP Inc.*, 881 F.3d 1360, 1368 (Fed. Cir. 2018). Under 35 U.S.C. § 101, “[w]hoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof,” is eligible for a patent on that invention. “[L]aws of nature, physical phenomena, and abstract ideas,” however, are patent ineligible concepts. *Alice Corp. Pty. Ltd. v. CLS Bank Int’l*, 573 U.S. 208, 216 (2014) (internal quotations and citation omitted). *Alice* articulates a two-step process to determine whether a claimed invention is patent eligible. *Id.* at 217. First, the Court must “determine whether the claims at issue are directed to a patent-ineligible concept.” *Id.* at 218. A finding of patent eligibility at step one ends the inquiry. *See e.g., Enfish, LLC v. Microsoft Corp.*, 822 F.3d 1327, 1339 (Fed. Cir. 2016). In the context of computer programs, claims that improve the way a computer operates or solve a technological problem are patent eligible, but claims that merely use a computer to implement well-known business or economic practices are not. *Id.* “[I]mproving a user’s experience while using a computer application is not, without more, sufficient to render the claims directed to an improvement in computer functionality.” *Customedia Techs., LLC v. Dish Network Corp.*, 951 F.3d 1359, 1365 (Fed. Cir. 2020).

If the claims involve a patent-ineligible concept, the Court must then “consider the elements of each claim both individually and as an ordered combination to determine whether the additional elements ‘transform the nature of the claim’ into a patent-eligible application.” *Alice*, 573 U.S. at 217 (internal quotations and citation omitted). At this step, the Court must “search for

an inventive concept—*i.e.*, an element or combination of elements that is sufficient to ensure that the patent in practice amounts to significantly more than a patent upon the ineligible concept itself.” *Id.* at 217–18 (internal quotations and citation omitted). The party challenging the validity of a patent—in this case, IBG—bears the burden of establishing invalidity, including patent ineligibility, by clear and convincing evidence. *See* 35 U.S.C. § 3582 (establishing a rebuttable presumption of patent validity and placing the burden of establishing invalidity on the party asserting invalidity).

I. The ‘132 and ‘304 Patents

The Federal Circuit has already held that the ‘132 and ‘304 Patents are eligible under 35 U.S.C. § 101. *Trading Techs. Int'l, Inc. v. CQG, Inc.*, 675 F. App'x 1001, 1002 (Fed. Cir. 2017). In *CQG* the court observed that the ‘132 and ‘304 Patents “do not simply claim displaying information on a graphical user interface[,]” but are directed to “resolv[ing] a specifically identified problem in the prior state of the art[,]” namely, “that the best bid and best ask prices would change based on updates received from the market.” *Id.* at 1004; *Trading Techs. Int'l, Inc. v. CQG, Inc.*, No. 05-CV-4811, 2015 WL 774655, at *4 (N.D. Ill. Feb. 24, 2015), *aff'd*, 675 F. App'x 1001 (Fed. Cir. 2017). As the district court explained:

There was a risk with the prior art GUIs that a trader would miss her intended price as a result of prices changing from under her pointer at the time she clicked on the price cell on the GUI. The patents-in-suit provide a system and method whereby traders may place orders at a particular, identified price level, not necessarily the highest bid or the lowest ask price because the invention keeps the prices static in position, and allows the quantities at each price to change.

CQG, 2015 WL 774655, at *4. Thus, the court concluded, the ‘132 and ‘304 Patents were patent eligible under *Alice* step one and not directed to an abstract idea. *CQG*, 675 F. App'x at 1004.

IBG argues *CQG* does not compel a finding of eligibility in this case because it is a nonprecedential opinion and involved a different set of facts than those before this Court. First,

the Court may (and should) rely on nonprecedential opinions interpreting the same patent to ensure the uniform treatment of that patent. *See e.g., Burke, Inc. v. Bruno Indep. Living Aids, Inc.*, 183 F.3d 1334, 1337 (Fed. Cir. 1999). With respect to the ‘132 and ‘304 patents, the Court has no qualms in relying on *CQG* which involved the same legal question (§ 101 eligibility) and the same patents.

Regarding the distinct factual record in *CQG*, IBG claims an independent *Alice* inquiry is required because the *CQG* court did not consider the evidence of prior art before this Court. Step one of the *Alice* framework, however, “does not require an evaluation of the prior art or facts outside of the intrinsic record regarding the state of the art at the time of the invention.” *CardioNet, LLC v. InfoBionic, Inc.*, 955 F.3d 1358, 1374 (Fed. Cir. 2020), *cert. denied sub nom. InfoBionic, Inc. v. Cardionet, LLC*, 141 S. Ct. 1266 (2021). Although *CQG* court did not have evidence of every alleged prior art reference IBG presents, it did have some evidence of “prior art GUI’s that showed market dept and the inside market in a table or grid,” including the INTEX system. (Dkt. 1527-4). More importantly, the court considered the intrinsic evidence of prior art disclosed by the patents themselves in Figure 2. While the *CQG* court found it relevant that the ‘132 and ‘304 Patents had “no pre-electronic trading analog” and were “not an idea that has long existed,” *CQG*, 675 F. App’x at 1004, more evidence regarding prior art does not compel a different conclusion as to eligibility: “[t]he analysis under *Alice* step one is whether the claims as a whole are directed to an abstract idea, *regardless of* whether the prior art demonstrates that the idea or other aspects of the claim are known, unknown, conventional, unconventional, routine, or not routine.” *CardioNet*, 955 F.3d at 1372 (internal quotations and citation omitted) (emphasis added). The Court sees no reason to disrupt the Federal Circuit’s holding regarding the eligibility of the ‘132 and ‘304 Patents

based solely on the prior art evidence presented by IBG. TT's motion for summary judgment is granted as to the '132 and '304 Patents.

II. The '411 and '996 Patents

A. Alice Step One: Abstract Idea

The issue of patent eligibility with respect to the '411 and '996 Patents is one of first impression. IBG argues the '411 and '996 Patents are directed to the unpatentable abstract idea "of placing an order based on observed, dynamically updated market information" rather than to an improvement in computer technology. (Dkt. 1387 at 10). TT asserts the '411 and '996 Patents are directed to technological improvements in speed, accuracy, and usability. (Dkt. 13 at 7).

The representative claims of the '411 and '911 patents respectively claim "[a] method of displaying market information relating to and facilitating trading of a commodity being traded on an electronic exchange" and "[a] computer readable medium having program code recorded thereon for execution on a computer having a graphical user interface and a user input device," that recite steps of receiving market information for a commodity from an electronic exchange and displaying such information in a dynamic way. (Dkt. 1120 at Ex. S, Ex. U). The mere process of gathering information and displaying the results, however, is unpatentable. *See e.g., Elec. Power Grp., LLC v. Alstom S.A.*, 830 F.3d 1350, 1354 (Fed. Cir. 2016). While TT claims the asserted invention improves the speed, accuracy, and usability of trading GUIs, it is clear that the goal of providing market information in the specific configuration recited by the patents is to "improv[e] the trader, not the functioning of the computer." *Trading Techs. Int'l, Inc. v. IBG LLC*, 921 F.3d 1378, 1383 (Fed. Cir. 2019). For example, both patents disclose "[a] method and system for reducing the time it takes for a *trader* to place a trade when electronically trading on an exchange, thus increasing the likelihood that the *trader* will have orders filled at desirable prices and

quantities.” (Dkt. 1120 at Ex. S, Ex. U) (emphasis added). Similarly, the patents explain that the invention “allows the *trader* to trade quickly and efficiently” and that “[t]rends in the trading of the commodity and other relevant characteristics are more easily identifiable by the *user* through the use of the present invention.” (*Id.*) (emphasis added). Because the claims of both patents “are focused on providing information to traders in a way that helps them process information more quickly, not on improving computers or technology[,]” they are directed towards the abstract idea of placing orders on an electronic exchange. *Trading Techs.*, 921 F.3d at 1383.

TT argues that as the *CQG* court found with respect to the ‘132 and ‘304 Patents, the ‘411 and ‘996 Patents are patent eligible because they solve the missing-the-intended-price problem. While the ‘411 and ‘996 Patents are continuations of the ‘132 and ‘304 Patents and share a common specification, the specific claims of the ‘132 and ‘304 Patents are narrower in that they recite a truly static price axis. *Trading Techs. Int'l, Inc. v. IBG LLC*, 921 F.3d 1084, 1095 (Fed. Cir. 2019) (“Eligibility depends on what is claimed, not all that is disclosed in the specification.”). It is not clear, and TT does not explain, how the ‘411 and ‘996 Patents, which include price axes that automatically move, solve the missing-the-price problem. See *IBG LLC v. Trading Techs. Int'l, Inc.*, No. CBM2016-00054, 2017 WL 4708078, at *15 (P.T.A.B. Oct. 17, 2017), aff'd *Trading Techs. Int'l, Inc. v. IBG LLC*, 767 F. App'x 1006, 1007 (Fed. Cir. 2019) (rejecting *CQG* as persuasive authority on the basis that ‘132 and ‘304 Patents recited narrower claims than the related patent at issue which “d[id] not recite the static price axis feature....”). Moreover, even the *CQG* court noted that the ‘132 and ‘304 Patents presented a “close question[] of eligibility....” *CQG*, 675 F. App'x at 1006. Thus, the Court is not inclined to extend the reasoning of *CQG*, a nonprecedential opinion, to related patents that do not share the same claim limitations (a static price axis).

TT also cites another nonprecedential decision, *IBG LLC v. Trading Techs. Int'l, Inc.*, 757 F. App'x 1004, 1006 (Fed. Cir. 2019), in which the Federal Circuit found that the '411 and '996 Patents did not qualify for Covered Business Method ("CBM") review because they recited technological inventions. *IBG*, however, did not concern § 101 eligibility. *Id.* While the inquiries under CBM review and § 101 eligibility are related, the *IBG* court's decision does not dictate a finding of § 101 eligibility here.

The Court is hesitant to rely on *IBG* to support a finding of § 101 eligibility particularly in light of subsequent Federal Circuit decisions finding related TT Patents ineligible under § 101. TT's '768 and '382 Patents are continuations of the '132 Patent and share the same specification as the Patents in suit. (Dkt. 1537 at ¶¶ 56, 63) (*Id.* at Ex. 7, Ex. 74). Like the '411 and '996 Patents, they recite steps of receiving and dynamically displaying market information along a price axis that is not required to remain static. (Dkt. 1401 at Ex. 7, Ex. 74). After the *IBG* decision, the Federal Circuit held that the '768 and '382 Patents were patent ineligible because they "focus on improving the trader, not the functioning of the computer." *Trading Techs.*, 767 F. App'x at 1007; *Trading Techs. Int'l, Inc. v. IBG LLC*, 771 F. App'x 493 (Fed. Cir. 2019). Thus, although *IBG* found that the '411 and '996 Patents recited technological innovations for purposes of CBM review, the Federal Circuit's subsequent decisions regarding nearly identical patent claims support a finding of § 101 ineligibility for the '411 and '996 Patents.

B. Alice Step Two: Innovative Concept

As the '411 and '996 Patents are directed to the abstract idea of placing orders on an electronic exchange, the Court must also consider whether the elements of the representative claims, individually and as an ordered combination, recite an innovative concept. The representative claims of the '411 and '996 Patents recite steps of (1) receiving information, (2)

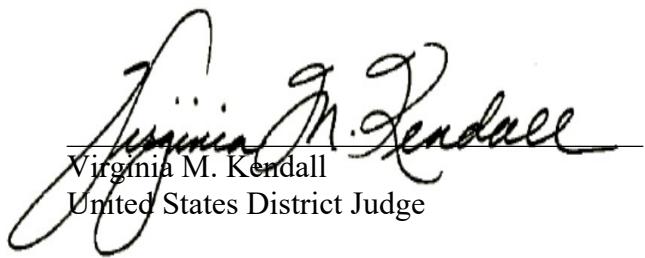
dynamically displaying such information along a price axis on a GUI, and (3) displaying an order entry region through which traders can place orders with a single action by the trader.

The mere receipt of information is not innovative. Here, the patents disclose that “[i]rrespective of what interface a trader uses to enter orders in the market, each market supplies and requires the same information to and from every trader.” (Dkt. 1120 at Ex. S, Ex. U). Displaying and plotting information available to all is no more inventive. *See Elec. Power*, 830 F.3d at 1353. This is particularly so, where “the system of the present invention can be implemented on any existing or future terminal or device” and “[t]he physical mapping of ... information to a screen grid can be done by any technique known to those skilled in the art” of trading. (Dkt. 1120 at Ex. S, Ex. U). Finally, as Figure 2 discloses, a one-click order entry region on a GUI already existed at the time of the claimed invention. (*Id.*)

Considering the claim elements together, it is clear by comparing the prior art in Figure 2 and the claimed invention in Figure 3, that the invention merely claims a rearrangement of market information known to be displayed in a different format. (*Id.*) While this rearrangement has benefits over the prior art, the rearrangement is not innovative in that it solves a technical problem. *Cf. CQG*, 2015 WL 774655, at *5, *affd CGQ*, 675 Fed. App’x at 1004 (“[A]t least the ‘static price axis’ element of the [‘132 and ‘304] patents in suit [i]s an ‘inventive concept’, which eliminated some problems of prior GUIs relating to speed, accuracy, and usability....”). It is innovative in the sense that it helps traders place trades more quickly and efficiently. (*See* Dkt. 1120 at Ex. S, Ex. U). An analysis of the elements of the representative claims confirms that the subject matter of the ‘411 and ‘996 Patents is ineligible under § 101. For that reason, IBG’s motion for summary judgment is granted.

CONCLUSION

For the foregoing reasons, TT's Motion for Summary Judgment that the Claims of the Patents-in-Suit are Patent-Eligible [1359] is granted in part and denied in part. IBG's Motion for Summary Judgment of Unpatentability of U.S. Patent Nos. 7,676,411 and 7,813,996 [1387] is granted.



Virginia M. Kendall
United States District Judge

Date: June 17, 2021

Case: 1:10-cv-00715 Document #: 1984 Filed: 07/23/21 Page 1 of 4 PageID #:109437

**IN THE UNITED STATES DISTRICT COURT
NORTHERN DISTRICT OF ILLINOIS
EASTERN DIVISION**

TRADING TECHNOLOGIES)
INTERNATIONAL, INC.,)
)
<i>Plaintiff,</i>) No. 10 C 715
)
v.) Judge Virginia M. Kendall
)
IBG LLC, <i>et al,</i>)
)
<i>Defendants.</i>)

ORDER

Before the Court is IBG's motion to exclude Catherine M. Lawton's opinion that TT is entitled to a reasonable royalty of approximately \$900 million for IBG's infringement. (Dkt. 1665). For the reasons set forth below, IBG's motion is granted in part and denied in part.

LEGAL STANDARD

Federal Rule of Evidence 702 permits expert testimony only if: "(a) the expert's scientific, technical, or other specialized knowledge will help the trier of fact to understand the evidence or to determine a fact in issue; (b) the testimony is based on sufficient facts or data; (c) the testimony is the product of reliable principles and methods; and (d) the expert has reliably applied the principles and methods to the facts of the case." Fed. R. Evid. 702. In other words, it is this Court's task to "ascertain whether the expert is qualified, whether his or her methodology is scientifically reliable, and whether the testimony will assist the trier of fact to understand the evidence or to determine a fact in issue." *Bielskis v. Louisville Ladder, Inc.*, 663 F.3d 887, 893 (7th Cir. 2011) (quotations omitted). The expert's proponent bears the burden of demonstrating that the testimony would satisfy the Daubert standard by a preponderance of the evidence. *Gopalratnam v. Hewlett-Packard Co.*, 877 F.3d 771, 782 (7th Cir. 2017).

DISCUSSION

I. Royalty Base and Rate

Reasonable royalty damages must reflect "the use made of the invention by the infringer." 35 U.S.C. § 284. "Where small elements of multi-component products are accused of infringement, calculating a royalty on the entire product carries a considerable risk that the patentee will be improperly compensated for non-infringing components of that product." *LaserDynamics, Inc. v. Quanta Computer, Inc.*, 694 F.3d 51, 67 (Fed. Cir. 2012). Thus, the damages calculation "must reflect the value attributable to the infringing features of the product, and no more." *Ericsson, Inc. v. D-Link Sys., Inc.*, 773 F.3d 1201, 1226 (Fed. Cir. 2014). "[A]ppportionment can

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be addressed in a variety of ways, including ‘by careful selection of the royalty base to reflect the value added by the patented feature [or] ... by adjustment of the royalty rate so as to discount the value of a product’s non-patented features; or by a combination thereof.’” *Exmark Mfg. Co. Inc. v. Briggs & Stratton Power Prod. Grp., LLC*, 879 F.3d 1332, 1348 (Fed. Cir. 2018) (citing *Ericsson, 773 F.3d at 1226*). The Court must “exercise[] its gatekeeping authority to ensure that only theories comporting with settled principles of apportionment [a]re allowed to reach the jury.” *Virnetx, Inc. v. Cisco Sys., Inc.*, 767 F.3d 1308, 1328 (Fed. Cir. 2014).

BookTrader is only one ordering functionality within IBG’s TWS and WebTrader products. (Dkt. 1668-5 at 25). Every copy of TWS and WebTrader includes BookTrader, such that a trader has access to BookTrader by virtue of purchasing TWS and WebTrader. (Dkt. 1723-2 at ¶ 29). IBG maintains Lawton’s royalty calculation must be excluded because it is premised on a royalty base comprising *all* TWS and WebTrader users, rather than on the smaller subset of traders who actually use BookTrader. (Dkt. 1723-2 at ¶¶ 32, 729). Similarly, IBG argues Lawton’s royalty rate, derived from comparable settlement agreements, is flawed because the royalties in the agreements contemplated only the licensee’s use of the licensed product, rather than access to the licensed product along with a broader suite of trading products.

Contrary to IBG’s assertions, for purposes of apportionment the term “use” is broader than strict usage and may encompass the value of having access to the infringing product. *See Lucent Techs., Inc. v. Gateway, Inc.*, 580 F.3d 1301, 1334 (Fed. Cir. 2009) (“A company licensing a patented method often has strong reasons not to tie the royalty amount strictly to usage [W]ith some inventions ... value is added simply by having the patented invention available for use.”); *see also Hanson v. Alpine Valley Ski Area, Inc.*, 718 F.2d 1075, 1080–81 (Fed. Cir. 1983) (approving reasonable royalty not based on actual use of the patented device but on what a party would have paid to have the device available to use). TT presents evidence that the settlement agreements encompassed access to the licensed products, in addition to use. (See Dkt. 1723-11 at ¶¶ 1.6, 3.3) (Dkt. 1723-12 at ¶¶ 1.7, 3.2) (Dkt. 1723-13 at ¶¶ 1.7, 3.2) (all providing that licensee “shall pay to TT a monthly minimum royalty of \$50.00 per End User to whom a Licensed Product is licensed” and defining “End User” as “any individual with direct or indirect access to electronic trading software....”). There is also some evidence that the licensed products in the agreements were sold as part of a broader array of trading products. (Dkt. 1723-11 at TTX00031192) (licensee sells electronic trading software, namely J-Trader and H-Trader, incorporating the licensed DOME screen product) (Dkt. 1723-12 at TTX0067606) (licensee sells “electronic trading software incorporating NinjaTrader SuperDOM[,]” the licensed product) (Dkt. 1723-13 at ¶ 13.4) (licensee sells licensed product “Strategy Runner Pro/Lite with Static Market Panes software...”). Lawton applied the royalty rate derived from these agreements to a royalty base of all users with access to BookTrader through TWS and WebTrader. Thus, Lawton’s royalty base and rate are consistent. To the extent TT takes issue with Lawton’s access-based calculation, that is a matter of weight, not admissibility, and TT may challenge Lawton’s conclusions at trial.

II. Worldwide Damages

IBG also disputes Lawton’s inclusion of foreign TWS and WebTrader users in her royalty base. Lawton relies on four theories of infringement to justify her inclusion of foreign users: (1) making a copy of the accused products via a server located in the United States, (2) use of the

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accused products in the United States, (3) sale of the accused products in the United States via the user's entry into a Customer Agreement, and (4) making the accused products in the United States with foreign damages. (Dkt. 1723-2 at ¶ 748). Under the first three theories, the foreign user's actions constitute infringement *within the United States*, entitling TT to damages. Lawton's final theory is premised on an "understand[ing] that TT is entitled to worldwide patent damages for harm that is the foreseeable and but-for result of infringement in the United States." (Dkt. 1723-2 at ¶ 765). The Court begins by addressing this latter theory.

Generally, even after establishing one or more acts of infringement in the United States, a patentee may not recover damages for worldwide sales of the patented invention on the theory that "those foreign sales were the direct, foreseeable result of [the infringer's] domestic infringement." *Power Integrations, Inc. v. Fairchild Semiconductor Int'l, Inc.*, 711 F.3d 1348, 1371 (Fed. Cir. 2013). In *WesternGeco LLC v. ION Geophysical Corp.*, however, the Supreme Court held that a patent owner claiming infringement under 35 U.S.C. § 271(f)(2) may recover lost foreign profits proximately caused by domestic infringement. 138 S. Ct. 2129, 2139 (2018). As this Court has previously observed, however, the holding in *WesternGeco*, "is of limited value" to the present case involving infringement under § 271(a) and reasonable royalty damages. *See Trading Techs. Int'l, Inc. v. IBG LLC*, No. 10 C 715, 2020 WL 7408745, at n.2 (N.D. Ill. Dec. 17, 2020). The Supreme Court and Federal Circuit have not yet held that *WesternGeco* overruled *PowerIntegrations* with respect to infringement under § 271(a), and the Court declines to reach that conclusion in the absence of such precedent. Lawton's inclusion of foreign users in her royalty base premised on a theory of foreseeable foreign consequences of infringement is premised on a misapplication of controlling law. To the extent her ultimate conclusion relies on this theory, it must be excluded.

Lawton's "making a copy" and "sale" theories, are premised on foreign users downloading TWS and WebTrader from U.S.-based servers and entering a Customer Agreement as part of the download process. (Dkt. 1723-2 at ¶¶ 749–751, 754–763). IBG disputes the factual bases for these theories, but TT has presented sufficient factual material on which Lawton can base her conclusions. IBG is free to dispute these facts at trial. Moreover, this Court has already resolved these disputes in TT's favor when denying IBG's motion for summary judgment that the activities of foreign users do not constitute infringement in the United States. (Dkt. 1390). After considering the terms of the Customer Agreement and the fact that "[a]t least for some foreign users, IBG hosts TWS BookTrader on servers in the United States[,]” the Court concluded, "TT has presented sufficient factual detail to give rise to a reasonable inference that the transaction or series of transactions involved when a foreign user downloads and uses TWS BookTrader is in significant part a U.S.-based sale or offer to sell." *Trading Techs. Int'l, Inc. v. IBG LLC*, No. 10 C 715, 2020 WL 7408745, at *4 (N.D. Ill. Dec. 17, 2020).¹

Finally, it is unclear how Lawton's "use" theory applies to foreign users. Lawton does not explain how foreign users use the accused products in the United States and admitted at her deposition that the "use" theory does not apply "to the extent [a user's] physical location is outside

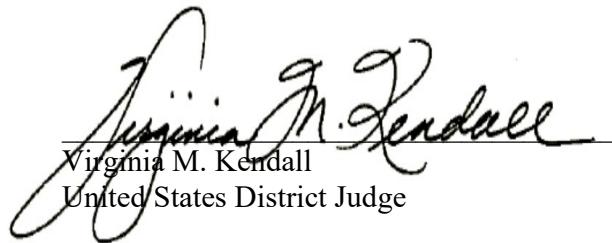
¹ TT only accuses WebTrader BookTrader of infringing the '411 and '996 Patents (Dkt. 1723-2 at ¶ 396), which are no longer at issue. *See Trading Technologies, Int'l. Inc., v. IBG, LLC, et al.*, No. 10 C 715, 2021 WL 2473809, at *6–*8 (N.D. Ill. June 17, 2021) (dismissing '411 and '996 Patents from suit). Thus, any factual deficiencies with respect to WebTrader are moot.

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the United States.” (Dkt. 1668-5 at 192). Thus, Lawton’s opinions must also be excluded to the extent her inclusion of foreign users in the royalty base relies on this theory.

CONCLUSION

For the foregoing reasons, IBG’s Motion to Exclude Damages Opinions of Catherine M. Lawton [1665] is granted in part and denied in part.



Virginia M. Kendall
United States District Judge

Date: July 23, 2021

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**IN THE UNITED STATES DISTRICT COURT
NORTHERN DISTRICT OF ILLINOIS
EASTERN DIVISION**

TRADING TECHNOLOGIES)
INTERNATIONAL, INC.,)
)
<i>Plaintiff,</i>) No. 10 C 715
)
v.) Judge Virginia M. Kendall
)
IBG LLC, <i>et al,</i>)
)
<i>Defendants.</i>)

MEMORANDUM OPINION AND ORDER

TT's Third Amended Complaint accused IBG's BookTrader product of infringing four of its patents: the '304, '132, '411, and '996 patents. (Dkt. 1118). At summary judgment, the Court held that the '411 and '996 patents were patent ineligible and granted partial summary judgment in IBG's favor. (Dkt. 1971). Following a jury trial on the remaining patents, the jury returned a verdict in TT's favor. (Dkt. 2134). The Court entered judgment as follows:

Jury Deliberations held and completed on 9/7/2021. Jury returns verdict as follows: With respect to Question 1 Infringement; Claims 1, 12, 15, 17, 22, 27 as to '304 Patent For TT; Claims 1, 7, 8, 25, 51 as to '132 Patent For TT: With respect to Question 2 Willful Infringement; Finding for IB: With respect to Question 3 Obviousness; Claims 1, 12, 15, 17, 22, 27 as to '304 Patent For TT; Claims 1, 7, 8, 25, 51 as to '132 Patent For TT: With respect to Question 4 Damages; Finding for TT in the amount of \$6,610,985. Enter Judgment. Civil case terminated.

(Dkt. 2131). IBG now moves to correct or, in the alternative, amend the judgment to include the Court's holding that the '411 and '996 patents were invalid. Fed. R. Civ. P. 60(a); 59(e); (Dkt. 2136).¹ TT also moves to amend the judgment to include prejudgment and post-judgment interest.

¹ IBG initially moved to correct or amend the judgment to include the disposition of all 10 of the patents TT originally asserted against IBG. (Dkt. 2136). Subsequently, however, IBG narrowed its motion to only the '411 and '996 patents. (Dkt. 2156 at fn. 1).

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Fed. R. Civ. P. 59; (Dkt. 2137). For the following reasons, IBG’s motion is denied and TT’s motion is granted in part and denied in part.

LEGAL STANDARD

A motion filed under Rule 59(e) is one to alter or amend a judgment. Fed.R.Civ.P. 59(e). “A motion to alter or amend a judgment under Rule 59(e) may be granted to correct a manifest error of law or fact.” *Duran v. Town of Cicero*, 653 F.3d 632, 642 (7th Cir.2011), citing *Harrington v. City of Chicago*, 433 F.3d 542, 546 (7th Cir.2006). Similarly, under Rule 60(a), the “court may correct a clerical mistake or a mistake arising from oversight or omission whenever one is found in a judgment, order, or other part of the record.” Fed. R. Civ. P. 60(a).

DISCUSSION

I. IBG’s Motion to Correct or Amend the Judgment

IBG request the Court correct or amend the judgment to reflect its disposition of the ‘411 and ‘996 patents in its favor. Judicial opinions granting partial summary judgment are interlocutory orders that “merge[] into a subsequent final judgment.” *Crown Packaging Tech., Inc. v. Rexam Beverage Can Co.*, 559 F.3d 1308, 1311 (Fed. Cir. 2009). For this reason, there is no need to correct or amend the judgment in this case to reflect the Court’s prior summary judgment rulings—those decisions are already part of the final judgment. IBG argues “the principle of merger is inapposite because it relates to appellate jurisdiction over interlocutory decision, not to motions to correct or amend a judgment.” (Dkt. 2156 at 1). While that is true, the implication of the rule that interlocutory orders are generally only appealable after final judgment is that such orders are considered part of the final judgment. See *Wingerter v. Chester Quarry Co.*, 185 F.3d 657, 662 (7th Cir. 1998) (Final judgment rule does not ““permit appeals, even from fully

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consummated decisions, where they are but steps towards final judgment in which they will merge.””) (quoting *Cohen v. Beneficial Indus. Loan Corp.*, 337 U.S. 541, 546 (1949)).

Abbot Labs v. Baxter Healthcare Corp., cited by IBG, is distinguishable. No. 04 C 836, 2010 WL 3894427, at *3 (N.D. Ill. Sept. 30, 2010). There, the defendant filed its motion for summary judgment prior to filing a counterclaim seeking declaratory judgment that the patent-in-suit is not infringed. *Id.* The court granted summary judgment in defendant’s favor on the issue of infringement, but because a request for declaratory judgement was not included in defendant’s summary judgment motion, the court did not grant summary judgment as to the declaratory judgment claim. *Id.* Under such circumstances, which the court characterized as “a mistake arising from oversight[,]” the court granted defendant’s motion to amend the judgment to include a declaratory judgment that defendant did not infringe the patent at issue. *Id.* Here, there is no mistake or oversight; all of the parties’ claims have been accounted for. The claims regarding the ‘411 and ‘996 patents were resolved in IBG’s favor at summary judgment and the claims regarding the ‘132 and ‘304 patents were resolved in TT’s favor at trial. IBG’s motion is denied.

II. TT’s Motion to Amend

TT requests the Court amend the judgment to include an award of prejudgment and post-judgment interest. An award of prejudgment interest is the default rule in patent cases. *See e.g., Gen. Motors Corp. v. Devex Corp.*, 461 U.S. 648, 655 (1983) (“In the typical case an award of prejudgment interest is necessary to ensure that the patent owner is placed in as good a position as he would have been in had the infringer entered into a reasonable royalty agreement.”); *Crystal Semiconductor Corp. v. TriTech Microelectronics Int'l, Inc.*, 246 F.3d 1336, 1361 (Fed. Cir. 2001) (“[P]rejudgment interest [is] the rule, not the exception.”). The Court may, however, decline to award or limit prejudgment interest in certain circumstances, including when the patentee unduly

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delays prosecution. *Gen. Motors*, 461 U.S. at 657; *Crystal*, 246 F.3d at 1361. Nonetheless, “[a]bsent prejudice to the defendants, any delay by the patentee does not support the denial of prejudgment interest.” *Crystal*, 246 F.3d at 1361–62 (internal quotations and citation omitted).

IBG argues TT unduly delayed prosecution when it waited to bring suit for nearly six years, despite being aware of the infringing BookTrader product in March 2004. IBG presents evidence that TT’s decision to delay suit was the result of a litigation decision to go after smaller, direct competitors first before turning to larger brokers such as IBG. (Dkt. 2160 at 3–4) (quoting Trial Transcript at 733, 4138). This decision sent conflicting messages to IBG regarding the infringing nature of its BookTrader product. In 2004, TT published an Open Letter to the futures trading industry informing the industry of its patents and intention to enforce them. (Dkt. 2160 at Ex. D). At the time, IBG perceived the letter, which explicitly mentioned IBG as a competitor, as a threat of suit, but when TT did not pursue litigation year after year, despite pursuing litigation against 18 other competitors in 2004 and 2005, (*id.* at Ex. C), IBG thought TT “was satisfied that we had a moving price axis and we weren’t violating its patent.” (Dkt. 2167 Ex. C, Nemser Direct at 2756); *see also* (Dkt. 2167 Ex. A, Petterfy Direct at 1929) (Q: So when you didn’t hear from TT for six years, what did you think? A: I thought they had looked into our background, realized who we were, and they didn’t want to prosecute this any long[er].”).

Apart from the accrual of prejudgment interest, however, IBG does not adequately demonstrate how TT’s decision to delay suit caused it actual prejudice. *See e.g., Lisle Corp. v. A.J. Mfg. Co.*, No. 02 C 7024, 2004 WL 765872, at *1 (N.D. Ill. Apr. 7, 2004) (awarding prejudgment interest although patentee waited six years to sue where defendant failed to demonstrate prejudice independent of accrual of prejudgment interest). Accumulation of prejudgment interest will *always* occur where there is *any* delay in prosecution by the patentee. Mere delay, absent

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prejudice, however, is insufficient to deny a prevailing patentee prejudgment interest. *See e.g.*, *Lummus Indus., Inc. v. D.M. & E. Corp.*, 862 F.2d 267, 275 (Fed. Cir. 1988); *Crystal*, 246 F.3d at 1361. IBG claims that had TT timely informed it of its infringement allegations, “IB could have easily altered BookTrader to design around TT’s patents” by switching to an always-centered price ladder like other competitors or by offering BookTrader as a standalone product. (Dkt. 2160 at 4–5). This assertion, however, is undercut by the fact that IBG never altered BookTrader to switch to either of these alleged alternatives even after being sued in 2010.

Crystal Semiconductor, cited by IBG, is distinguishable. 246 F.3d at 1361–62. There, the Federal Circuit denied prejudgment interest where the patentee failed to notify the defendant of its patents, despite having determined that defendants’ product infringed its patents. *Id.* Notably, the patentee informed 30–40 other companies of its patents but did not notify defendants until bringing suit two years later. *Id.* at 1362. Under these circumstances, the court held that the patentee’s two-year “delay was self-serving and resulted in prejudice to the defendants.” *Id.* Unlike the patentee in *Crystal Semiconductor*, TT did not attempt to hide its patents from IBG as part of some self-serving litigation tactic. The 2004 Open Letter explicitly mentioned IBG and IBG was aware of the letter, as well as TT’s patents. *See* (Dkt. 2160 at Ex. D); (Dkt. 2167 at Ex. A, Ex. C). Moreover, IBG was aware of and followed TT’s litigation against other competitors. (Dkt. 2167 Ex. C at 2752–56).

If prejudgment interest were not the default rule in patent cases, the Court might be more swayed by IBG’s position, as there was no need, apart from a litigation decision to go after other competitors first, for TT to delay suit against IBG. *See for example, Milwaukee Elec. Tool Corp. v. Snap-On Inc.*, 288 F. Supp. 3d 872, 907 (E.D. Wis. 2017) (limiting prejudgment interest where patentee delayed suit merely due to a litigation decision to sue larger industry players first).

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Nonetheless, IBG has failed to demonstrate the sort of bad faith conduct or prejudice warranting variance from this rule. For this reason, an award of prejudgment interest is justified in this case.

The parties also disagree as to the amount of prejudgment interest that should be awarded. Their primary dispute concerns whether the jury's damages award should be characterized as a lump-sum payment, in which case, prejudgment interest applies to the entire amount over the 17-year infringement period, or whether it reflects a running royalty, in which case, prejudgment interest is applied to each reasonable royalty payment IBG would have paid TT based on its use of TT's product.

Both parties' damages experts offered damages opinions based on the reasonable royalty IBG and TT would hypothetically negotiate at the start of the infringement period and their suggested award amounts were tied to actual use or access to the patented invention. (Trial Transcript at 1822, 3273). Both experts relied on the same three comparable agreements, each structured as running royalty arrangement, whereby the licensee would remit royalty payments to TT on a monthly or quarterly basis based on their use of TT's patented invention. (*Id.* at 1676–77, 3352); (Dkt. 2160 at Ex. H–J). Based on the damages testimony offered at trial, it is reasonable to conclude that the jury's award most likely reflects a running royalty amount rather than a lumpsum payment. This conclusion is bolstered by the fact that the jury's damages award exactly matches one of the proposed damages amount offered by IBG's damages expert, who opined that at a reasonable royalty rate of 10 cents per user in the United States, based on the amount of IB customers who actually used BookTrader, the damages amount would be \$6,610,985. (Trial Transcript at 3330, 3273).

Based on TT's business practices with other licensees, it is reasonable to conclude that had IBG and TT negotiated a licensing arrangement, IBG would have paid TT royalties on a quarterly

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basis² based on IBG customers' use of TT's product. (Dkt. 2160 at Ex. H–J, L). Critically, TT would not have received the entire \$6,610,985 damages amount in July 2004, because it would not have known how much IBG's customers would use its product over the course of the next 17 years. The purpose of prejudgment interest awards is "to ensure that the patent owner is placed in *as good* a position as he would have been in had the infringer entered into a reasonable royalty agreement."*Gen. Motors*, 461 U.S. at 655 (emphasis added). To treat the damages award as a lumpsum and charge interest on it over the course of the infringement period would overcompensate TT by awarding it interest on money it would not have yet received. Indeed, the difference in the lumpsum interest award advocated by TT, \$7,334,417, and the running royalty interest award advocated by IBG, 2,099,171, is telling³. Awarding interest on royalty payments as TT would have received them based on IBG's use of its patented invention is the most accurate way to compensate TT.

Next, while the parties agree that the prime rate should be used to calculate interest, they disagree as to whether the average prime rate or a fluctuating, current prime rate should be used. In this Circuit, "the best starting point is to award interest at the market rate, which means an *average of the prime rate* for the years in question." *Cement Div., Nat'l Gypsum Co. v. City of Milwaukee*, 144 F.3d 1111, 1114 (7th Cir. 1998) (internal quotations and citation omitted) (emphasis added). While a few courts have veered from this approach by using a fluctuating rate, *see e.g., Ryl-Kuchar v. Care Centers, Inc.*, 564 F. Supp. 2d 817, 829 (N.D. Ill. 2008) (awarding prejudgment interest based "on the monthly prime rate set by the Federal Reserve during the months for which" plaintiff sought interest), the Seventh Circuit has on at least one occasion

² The transaction date IBG provided to the jury was based on quarterly amounts. (See Dkt. 2160 at Ex. E).

³ These numbers represent prejudgment interest calculated at the average prime rate, compounded monthly up until the date of the Court's original judgment.

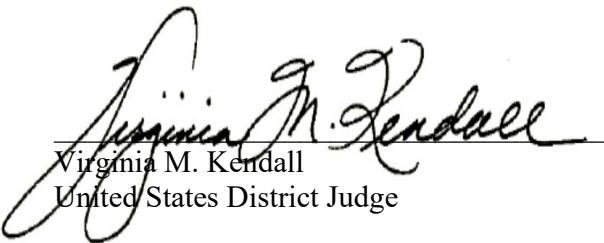
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suggested that the average rate should be used over a fluctuating, current rate. *First Nat. Bank of Chicago v. Standard Bank & Tr.*, 172 F.3d 472, fn. 9 (7th Cir. 1999) (“[W]e held that the average prime rate for the entire time period was the appropriate measure, rather than the current prime rate.”). Thus, the Court will adhere to the standard approach of utilizing the average prime rate and amend the final judgment to include an award of prejudgment interest on the jury award of \$6,610,985 at a rate of 4.413% beginning in July 2004 through the date of this Order, compounded monthly, for a total of \$2,122,355.⁴

Finally, IBG does not contest the award of post-judgment interest in this case. Thus, the final judgment is also amended to include an award of post-judgment interest on the jury award of at a rate of 0.07% beginning on September 7, 2021, compounded annually. Post-judgment interest on the pre-judgment interest is also awarded beginning on the date of this Order at a rate of 0.41%, compounded annually.⁵

CONCLUSION

For the foregoing reasons, IBG’s motion to correct or, in the alternative, amend the judgment is denied and TT’s motion to amend the judgment is granted in part and denied in part.



Virginia M. Kendall
United States District Judge

Date: January 11, 2022

⁴ The parties agree that the prejudgment interest owed through the date of the Court’s original judgment, September 7, 2021, using the average prime rate, compounded monthly is \$\$2,099,171. (Dkt. 2160 at fn. 13) (Dkt. 2167 at fn. 2). A daily rate of \$184 per day is then applied through the date of the amended judgment, January 11, 2022, to reach a total amount of \$2,122,355. (Dkt. 2160 at fn. 13).

⁵ The applicable post-judgment interest rate is “equal to the weekly average 1-year constant maturity Treasury yield ... for the calendar week preceding the date of the judgment.” 28 U.S.C. § 1961(b). For the week beginning January 3, 2022, the applicable average rate is 0.41%. See Federal Reserve Select Interest Rates, <https://www.federalreserve.gov/releases/h15/>.

**IN THE UNITED STATES DISTRICT COURT
NORTHERN DISTRICT OF ILLINOIS
EASTERN DIVISION**

HARRIS BRUMFIELD, TRUSTEE FOR)	
ASCENT TRUST,)	
))	
Plaintiff,))	No. 10 C 715
))	
v.))	Judge Virginia M. Kendall
))	
IB LLC, <i>et al</i> ,))	
))	
Defendants.))	

MEMORANDUM OPINION AND ORDER

Following a month-long jury trial in this patent infringement action, the jury returned a verdict in Trading Technologies’ (“TT”) ¹ favor, finding that IB’s BookTrader product infringed TT’s ‘304 and ‘132 patents. (Dkt. 2134). The jury awarded TT \$6,610,985 in damages. (*Id.*). Before the Court is TT’s motion for a new trial on damages and for post-trial damages discovery. Fed. R. Civ. P. 50(b); Fed. R. Civ. P. 59(a)(1)(A); Fed. R. Civ. P. 60(b)(3). For the following reasons, TT’s motion (Dkt. 2138) is denied.

BACKGROUND

I. Discussion of Hot Key Framework at Trial

During discovery and trial, IB maintained that it accurately tracked the amount of customer trades executed through BookTrader since 2006, which represented only 3–5% of the total trades made through Trader WorkStation (“TWS”). (Trial Transcript at 370, 2134, 2493, 3239–40, 4116–17) (Dkt. 2138 at Ex. 3). IB claimed to track orders based on the tool used to submit a given order

¹ Since the completion of trial and the filing of this motion, TT transferred its interest in the patents-in-suit to Harris Brumfield. (Dkt. 2188). The Court accordingly granted TT’s motion to substitute Mr. Brumfield as the Plaintiff in this action. (Dkt. 2216). For purposes of consistency and to avoid confusion, however, the Court continues to refer to TT the Plaintiff.

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to the exchange. Specifically, every tool within TWS, including BookTrader has a unique “order originator” tag such that orders can be tracked based on each tool. (*Id.* at 1500, 2197, 2495). Multiple IB witnesses confirmed the accuracy of the order originator tagging process and the transactions data derived from it. (*Id.* at 2199, 2498–99). IB’s damages expert, Brett Reed, relied on IB’s transaction data to derive a reasonable royalty calculation, which the jury ultimate adopted. (Trial Transcript at 3330, 3375) (Dkt. 2134).

At trial, one of IB’s witnesses, Dennis Stetsenko, explained that order originator tagging is part of a larger “hot key framework.” (*Id.* at 2494–95) (“the actual tagging part” of the framework was the “order originator”) (*see also id.* at 2558) (the “[h]ot key framework is a pathway on how the order originator gets assigned.”). Stetsenko testified that the hot key framework was a means to “connect user action, mouse or key stroke, with a tool” such that it allows IB to “track orders placed from a specific tool.” (*Id.* at 2494). TT claims this is the first time IB disclosed the hot key framework and its relation to order tagging.

II. Failure to Produce Hot Key Framework

In August 2019, TT issued the following discovery request to IB:

[D]ocuments sufficient to show how each category of information stored [customers, users, unique login identifiers, transaction data, audit data, logging data, or daily stat reports] is generated (including identify any source code files present in Trader WorkStation, WebTrader, BookTrader, and any related white-branded or white-labeled interfaces, or other programming regardless of where such files are present, responsible for logging, tracking, or generating the data)[.]

(Dkt. 2138 at Ex. 12). TT claims the hot key framework source code was responsive to this request, but that IB withheld it nonetheless.

IB maintains it produced the hot key framework source code in February 2020, well before trial. (Dkt. 2162 at Ex. A–B). In a post-trial declaration, Stetsenko explains “there is a specific code for BookTrader that assigns originators for BookTrader” called the “BookTrader Hot Key

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Code” and a “generic Hot Key Code,” both of which can be found among the source code IB produced to TT. (*Id.* at Ex. Q, ¶¶ 6–8). In addition, IB retained a source code expert, Dr. Benjamin Goldberg, who examined the produced source code and opined that IB did in fact produce the generic and BookTrader-specific hot key code. (*Id.* at Ex. R, ¶¶ 13–21). Both Stetsenko and Dr. Goldberg reference numerous filenames produced with the name “hotkey” in them in support of their testimony. (*Id.*); (*id.* at Ex. Q, ¶¶ 6–8). Dr. Goldberg further opined that the produced code “includes code relating to ‘originator’ field associations to indicate an order was placed using BookTrader” and that it is programmed to track such orders accurately. (*Id.* at Ex. R, ¶¶ 13, 22–26).

TT submits a competing declaration from Michael Fenn who maintains that notwithstanding the appearance of the term “hotkey” in the produced source code, what IB produced is not a true hot key code showing “the prevailing logic by which TWS assigns originator tags to orders placed using trading tools in TWS.” (Dkt. 2220 at Ex. B, ¶¶ 6, 12). Fenn admits TT was aware of the term “hotkey” prior to trial, but that it “had a singular meaning” as “refer[ring] to the user-definable mapping of actions (such as to buy or sell) on to keystrokes or mouse clicks....” (*Id.* at ¶ 10). According to TT, however, the hot key framework as a “tagging mechanism that TWS uses ... to correlate orders submitted within certain TWS tools” was not disclosed until Stetsenko’s trial testimony. (*Id.* at ¶ 8).

III. Tracking Orders via Origination Tool versus Order Entry Tool

As part of his discussion at trial of IB’s order tracking mechanisms, Stetsenko testified:

Q: Sir, you talked about IB having a mechanism to track commission—commissions attributable to Order Entry tools, right?

A: Attributable to trading tools, not Order Entry tools.

Q: To what?

A: To trading tools.

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Q: Oh, it tracks more than just Order Entry tools. It's just trading tools in general, right?

A: So it tracks orders placed from trading tools.

Q: Okay. But could a trading tool be something that doesn't allow you to enter orders?

A: Yeah.

(Trial Transcript at 2551–52). In a post-trial declaration from Harris Brumfield, TT proposes a distinction between a “trading tool,” which is a “tool related to trading” that may “consist of order entry tools and non-order entry trading tools” and an “order entry tool,” which is a “tool that users interface with to submit orders.” (Dkt. 2146 at Ex. 24, ¶ 4). TT and Brumfield claim Stetsenko’s trial testimony revealed for the first time that “IB is tracking orders/trades by trading tools, and not by order entry tools” and that the hot key framework “is the component of TWS that is responsible for tracking orders/trades by trading tools in TWS.” (*Id.* at ¶¶ 6, 12). Brumfield testifies that “tracking orders/trades by trading tools wiped out a large percentage of BookTrader’s trades, and gave credit for those trades to other trading tools.” (*Id.* ¶ 14). Consequently, TT claims the transactions data IB relied on for its damages calculation is severely flawed. In an effort to verify its theory, Brumfield conducted a post-trial investigation of stat reports previously produced by IB and admitted into evidence at trial, which revealed that of the 38 order entry tools identified by IB, five tools were actually non-order entry tools that nonetheless received credit for orders. (*Id.* at ¶ 7) (Dkt. 2229 at ¶ 9).

In his post-trial declaration, Stetsenko maintains “Brumfield is wrong—all of the tools he says are “non-order entry” tools are used by users to place orders. (Dkt. 2162 at Ex. Q, ¶ 22). He goes on to explain:

The order entry tools in TWS can largely be categorized in two categories: (a) those that are self-contained (i.e. they have their own order entry mechanism); and (b) those that are intended for order placement but do not have their own graphical order entry mechanism and thus use another IB tool for that purpose (e.g., Mosaic Market Dept (aka “Agg Book”)). For the first category, the mechanism of order

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entry is straightforward; a user simply clicks to place an order or uses the keyboard to input an order from that tool. BookTrader belongs to this first category. For the second category, because the tools are intended for order placement but do not have their own graphical order entry mechanism, IB purposely uses another tool, such as the tool Order Entry, for the graphical display that the user can interact with to place an order or the user can use the keyboard to input an order. For both categories, when an order is placed using the keyboard, the order is correctly tagged with the originator tag of the tool it originated from, not any other tool. Similarly, if the order is placed using the graphical interface, the order is correctly tagged with the originator tag of the tool it originated from.

(*Id.*) According to Stetsenko, the hot key source code does not contain “a secretive tagging mechanism that is changing or hiding the true extent of BookTrader use” as TT claims. (*Id.* at ¶¶ 9, 22).

Brumfield maintains Stetsenko’s explanation confirms that “[f]or IB, ‘originating’ an order and ‘submitting’ an order are distinct acts” because “[t]he tools in Mr. Stetsenko’s second category (b) are getting credit for ‘originating’ orders despite users not being able to use them to ‘submit’ orders to the exchange.” (Dkt. 2229 at ¶ 10). He concludes, in a slight alteration of his original proposition, that “[t]herefore, IB tracks orders and trades by what tools the orders originate from, not by what tools the orders are submitted from.” (*Id.*)

IV. TT’s New Trial Motion

On October 5, 2021, TT filed the present motion for a new trial and post-trial discovery premised on IB’s failure to disclose the hot key framework and its presentation of false trial testimony regarding the way it tracks orders and the accuracy of such orders. (Dkt. 2138).²

² In its opening brief, TT moved for a new trial on willfulness but failed to advance any argument or support for a new trial on that issue. (*See* Dkt. 2138). In its reply brief, TT revised its request to a default judgment of willfulness, but again advances no argument or support for such relief. (*See* Dkt. 2228). Accordingly, the Court declines to consider TT’s request for default judgment of willfulness. *See e.g., Kelso v. Bayer Corp.*, 398 F.3d 640, 643 (7th Cir. 2005) (argument waived where party “failed to cite any legal support or develop any legal argument in support of his position.”).

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LEGAL STANDARD

TT moves for relief under Federal Rules of Evidence 50, 59, and 60. Judgment as a matter of law, and new trial, is appropriate under Rule 50 if no “reasonable jury would have ‘a legally sufficient evidentiary basis to find for the party on that issue.’” *Empress Casino Joliet Corp. v. Balmoral Racing Club, Inc.*, 831 F.3d 815, 822 (7th Cir. 2016) (quoting Fed. R. Civ. P. 50). Rule 59 permits the Court to order a new trial “after a jury trial, for any reason for which a new trial has heretofore been granted in an action at law in federal court.” Fed. R. Civ. P. 59(a)(1)(A). “A new trial is appropriate if the jury's verdict is against the manifest weight of the evidence or if the trial was in some way unfair to the moving party.” *Venson v. Altamirano*, 749 F.3d 641, 656 (7th Cir. 2014). Under Rule 60(b)(3) “a court may set aside a judgment if a party engaged in fraud, misrepresentation, or misconduct by an opposing party.” *Wickens v. Shell Oil Co.*, 620 F.3d 747, 758 (7th Cir. 2010) (internal quotations and parentheticals omitted). Relief under Rule 60(b)(3) is “an extraordinary remedy granted only in exceptional circumstances.” *Fields v. City of Chicago*, 981 F.3d 534, 558 (7th Cir. 2020) (citation omitted). Fraud, misrepresentation, or misconduct are the proper bases of a new trial under either Fed. R. Civ. P. 59 or 60. *Brandt v. Vulcan, Inc.*, 30 F.3d 752, 758 (7th Cir. 1994). Thus, for purposes of the present motion, there is no substantive difference between the standard for new trial under Rule 59 or 60. See e.g., *White v. Anthology, Inc.*, No. 08 C 1371, 2009 WL 4215096, at *2 (N.D. Ill. Nov. 16, 2009).

DISCUSSION

I. Hot Key Code and Order Tracking

TT maintains it is entitled to a new trial because (1) IB failed to disclose the hot key framework source code until Stetsenko’s trial testimony and (2) IB and its witnesses falsely testified at trial that IB accurately tracks orders by order entry tool, when that is not the case. Under

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Rule 60(b)(3), the moving party “must demonstrate by clear and convincing evidence that: (1) the party maintained a meritorious claim at trial; and (2) because of the fraud, misrepresentation or misconduct of the adverse party; (3) the party was prevented from fully and fairly presenting its case at trial.” *Fields*, 981 F.3d at 558 (internal quotations and citation omitted). “In considering these requirements, a court must weigh the competing policy interests of the finality of judgment against fundamental fairness in light of all of the facts.” *Lonsdorf v. Seefeldt*, 47 F.3d 893, 897 (7th Cir. 1995). There is no dispute that TT prevailed at trial; the parties only dispute whether IB engaged in misconduct that prejudiced TT at trial.

A. Failure to Produce Hot Key Source Code

“[T]he failure to disclose information within the scope of proper discovery requests can, in certain circumstances, constitute grounds for a new trial” under Rule 60(b)(3). *Brandt*, 30 F.3d at 758. “In order to obtain this dramatic relief, the movant must demonstrate both that misconduct occurred and that it prejudiced him.” *Id.*

Here, the evidence indicates TT knew about the hot key framework prior to trial. In his post-trial declaration, Fenn admits that prior to trial, TT knew of and understood “the term ‘hotkey’ ... to refer to the user-definable mapping of actions (such as to buy or sell) onto keystrokes or mouse clicks....” (Dkt. 2220 at ¶ 10) (citing IB’s produced source code and user documentation). While TT claims this meaning is categorically different from the hot key framework Stetsenko disclosed at trial, Stetsenko’s discussion of the hot key framework at trial is entirely consistent with TT’s understanding of hot keys prior to trial. Stetsenko explained that the hot key framework is a means to “connect user action, mouse or key stroke, with a tool” such that it allows IB to “track orders placed from a specific tool.” (Trial Transcript at 2494). Thus, as TT already understood, the hot key framework is a means of connecting user actions to a mouse or key stroke. While TT

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claims it did not understand the relation hotkeys had to order originator tagging until trial, it fails to present clear and convincing evidence that this information gap was the result of IB's misconduct, rather than its own failure to ask adequate questions during discovery. TT knew IB implemented a system to connect user actions, such as entering an order, to mouse or key strokes. Yet, there is no indication TT ever asked *why* this hotkey system was implemented or whether it had any connection to order origination. If it had, perhaps TT would have understood, as Stetsenko testified at trial, that the hot key framework allowed IB to "track orders placed from a specific tool." (*Id.*)

According to TT, disclosure of the hot key source code prior to trial would have revealed that IB does not track orders by order entry tool, as IB had otherwise maintained. To verify this theory, Brumfield "spent hundreds of hours analyzing IB's entire platform and its numerous tools to map out tools that do not have order entry mechanisms, but for which IB attributes orders/trades." (Dkt. 2228 at 4–5). According to Brumfield, this post-trial investigation revealed that of the 38 order entry tools identified by IB, five tools were actually non-order entry tools that received credit for orders. (Dkt. 2146 at Ex. 24, ¶ 7) (Dkt. 2229 at ¶ 9). It is unclear, however, why this investigation could not have been performed earlier. All of the materials Brumfield relied on were produced prior to trial and admitted into evidence at trial. (Dkt. 2146 at Ex. 24, ¶¶ 7–8) (Dkt. 2229 at ¶¶ 8–9). Thus, notwithstanding the hot key code, TT had means prior to trial to discover that IB may not in fact track orders by order entry tool and it could have crossed IB's witnesses about this at trial. For example, Brumfield observes that although an IB witness testified at trial that Accumulate/Distribute is IB's "best" and "most advanced tool," "when we checked the admitted stat reports, Accumulate/Distribute was only responsible for .08% of IB's trades from June 2008–April 2019." (Dkt. 2229 at ¶ 12). He then concludes, "This enormous discrepancy with

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Accumulate/Distribute and its trades demonstrates the lack of correlation between tracking orders and trades by what tools the orders are submitted from and what tools the orders originate from.” (*Id.*) TT, however, knew of Accumulate/Distribute prior to trial and it also had access to the referenced stat reports prior to trial. (*See* Trial Transcript at 1982) (referencing Petterfy’s deposition testimony that “Accumulate Distribute is [IB’s] most important tool.”). Nothing prevented Brumfield from comparing IB’s assertion that Accumulate/Distribute is its most valuable tool with the stat reports prior to trial and reaching the same conclusion he reaches post-trial.

Similarly, TT points to an excerpt of source code from Blotter, a tool within TWS, and maintains that it shows “that originators used by IB’s order entry tools … are being overwritten by IB’s unproduced code and reflect that IB’s data is inaccurate[.]” (Dkt. 2138 at 9); (Dkt. 2140 at Ex. 15, ¶ 11). TT further cites an email regarding ChartTrader, another tool on a separate platform (IBKR Mobile), claiming it also supports discrepancies in the way IB tracks its orders. The Blotter code and ChartTrader email, however, were produced by IB prior to trial and it is not clear how IB’s alleged failure to disclose the hot key framework prior to trial prevented TT from analyzing the code or email to determine potential discrepancies in IB’s transactions data. Surely, TT cannot claim it had no reason to question IB’s assertion that it accurately tracks orders by order entry tool, because TT vehemently challenged the accuracy of IB’s transaction data at trial. (Trial Transcript at 4001–06). Once again, TT fails to demonstrate by clear and convincing evidence that IB’s failure to produce the hot key code, as opposed to its own failure to ferret out information during discovery, prevented it from fully and fairly litigating its case.

Ultimately, however, TT failed to present clear and convincing evidence that IB failed to produce the hot key source code during discovery. IB presents declarations from Stetsenko, an IB

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programmer and software developer who worked on TWS, and Dr. Goldberg, a source code expert. (Dkt. 2162 at Exs. Q–R). Both individuals reviewed the source code provided by IB to TT and testified that it contains the generic and BookTrader-specific hot key code. (*Id.* at Ex. Q, ¶¶ 6–8); (*Id.* at Ex. R, ¶¶ 13–21). This position receives support from the numerous filenames produced to TT with the term “hotkey” in the description. (*Id.*) TT presents rebuttal testimony from its own source code expert, Fenn, who opines that notwithstanding the appearance of the term “hotkey” in the produced source code, “IB has not produced the source code framework that reflects how the TWS source code actually tags (assigns) a given trade to a TWS tool based on an action taken in a different tool.” (Dkt. 2220 at Ex. B ¶ 12). In Dr. Goldberg’s expert opinion, however, the produced code “includes code relating to ‘originator’ field associations to indicate an order was placed using BookTrader” such that TT could “determine that the originator tags for BookTrader are associated with Hot Key functionality[.]” (Dkt. 2162 at Ex. R, ¶¶ 13, 19, 22–26). Fenn attempts to point out multiple technical flaws in Dr. Goldberg’s analysis, (Dkt. 2220 at Ex. B ¶¶ 15–21), but fails to provide any explanation or analysis of his own for why he believes the produced source code does not contain a true hot key framework. Thus, even if the Court were to discount Dr. Goldberg’s testimony, it has no factual basis to credit Fenn’s opinion. At best, there is conflicting expert testimony regarding whether IB produced the hot key source code, which is insufficient to satisfy the clear and convincing evidence standard for a new trial. TT’s new trial motion premised on IB’s discovery misconduct is denied.

B. False Testimony Regarding Order Tracking

TT maintains it is also entitled to a new trial because IB’s witnesses falsely testified at trial that IB accurately tracks BookTrader orders based on what tool is used to submit the order, when in fact, IB tracks orders based on origination tool. In support of its position, TT cites (1)

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Stetsenko's trial testimony; (2) Brumfield's investigation revealing IB credits orders to non-order entry tools; (3) an email regarding ChartTrader and Blotter source code; and (4) other documents uncovered post-trial.

Beginning with Stetsenko's trial testimony, Stetsenko testified:

Q: Sir, you talked about IB having a mechanism to track commission—commissions attributable to Order Entry tools, right?

A: Attributable to trading tools, not Order Entry tools.

Q: To what?

A: To trading tools.

Q: Oh, it tracks more than just Order Entry tools. It's just trading tools in general, right?

A: So it tracks orders placed from trading tools.

Q: Okay. But could a trading tool be something that doesn't allow you to enter orders?

A: Yeah.

(Trial Transcript at 2551–52). TT claims this is the first time IB disclosed that it does not track orders by order entry tool. In his post-trial declaration, however, Stetsenko explains: “I was making a distinction in my testimony between trading tool and the particular tool in TWS called ‘Order Entry’ which is a trading tool for placing orders.” (Dkt. 2162 at Ex. Q, fn. 3). TT provides no reason to discredit this explanation and the transcript, which both parties had an opportunity to review and correct, also capitalizes “Order Entry”, presumably referring to the specific tool, rather than order entry tools in general.

Next, Brumfield's post-trial investigation of IB's stat reports apparently revealed that of the 38 order entry tools identified by IB, five tools were actually non-order entry tools that nonetheless received credit for orders. (Dkt. 2146 at Ex. 24, ¶ 7) (Dkt. 2229 at ¶ 9). In his post-trial declaration, however, Stetsenko maintains “Brumfield is wrong—all of the tools he says are “non-order entry” tools are used by users to place orders. (Dkt. 2162 at Ex. Q, ¶ 22). Stetsenko explains that there are two types of order entry tools in TWS: “(a) those that are self-contained (i.e.

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they have their own order entry mechanism); and (b) those that are intended for order placement but do not have their own graphical order entry mechanism and thus use another IB tool for that purpose[.]” (*Id.*) For both categories, “the order is correctly tagged with the originator tag of the tool it originated from, not any other tool.” (*Id.*) TT accepts Stetsenko’s explanation, but argues that it proves that IB tracks orders by origination tool rather than order entry tool. TT seemingly ignores, however, that BookTrader is in the first category of tools, meaning that for orders placed through BookTrader the origination tool and order entry tool are the same. (*See id.*) Brumfield acknowledges this fact in his declaration: “A tool can both originate and submit an order, which is the case for tools in category one.” (Dkt. 2229 at ¶ 10). Thus, even if TT is correct that tracking by origination tool skews IB’s transaction data, any distinction between origination and order entry tools does not impact BookTrader trades and consequently, cannot establish by clear and convincing evidence that IB presented false trial testimony regarding the way it tracks such trades.

Similarly, the ChartTrader email and Blotter code are irrelevant to the manner in which IB tracks BookTrader trades. ChartTrader and Blotter are separate tools from BookTrader and ChartTrader is on an entirely separate platform, IBKR Mobile. (Dkt. 2162 at Ex. Q, ¶¶ 11–12). Further, unlike BookTrader, ChartTrader and Blotter operate akin to the second category of tools described by Stetsenko in which orders are or can be routed through a separate order entry tool. (*Id.* at fn. 5) (orders placed through IBKR Mobile are routed through the separate tool OrderEntry); (*id.* at ¶ 12) (Blotter allows orders to be submitted through the separate tool OrderTicket) (*see also* Dkt. 2162 at 8). Any discrepancies in order tracking suggested by this evidence cannot establish by clear and convincing evidence that IB presented false testimony regarding BookTrader order tracking at trial. Moreover, as the Court has already explained herein, nothing prevented Brumfield from performing his investigation or TT analyzing the ChartTrader email and Blotter

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code prior to trial and using them to cross IB's witnesses. Consequently, TT cannot show by clear and convincing evidence that its alleged inability to fully and fairly litigate its case was caused by IB's false testimony, as opposed to the shortcomings in its own trial preparation.

Finally, TT maintains that since trial, it "has uncovered even more evidence in IB's 3 million pages of production documents that further demonstrate the falsity of IB's witnesses' testimony." (Dkt. 2228 at 10). By TT's own admission, it had access to these documents prior to trial and could have crossed IB's witnesses regarding any perceived contradictions at trial. That TT failed to uncover such documents or use them at trial is a result of its own failing, rather than any misconduct by IB. TT fails to present clear and convincing evidence that IB does not track BookTrader orders based on order entry tool, and thus, fails to demonstrate that IB presented false testimony during trial. TT also fails to demonstrate by clear and convincing evidence that IB's misconduct, as opposed to its own actions, prejudiced TT. For these reasons, TT's new trial motion premised on IB's false trial testimony is denied.

II. Reliance on Noncomparable Agreements

TT also moves for judgment as a matter of law that because IB improperly relied on noncomparable settlement agreements the jury's low damages award was not supported by substantial evidence.³ TT maintains that prior to trial, IB's damages expert Brett Reed, opined that only three agreements were comparable to the July 2004 hypothetical negotiation (Patsystems, NinjaTrader; and Strategy Runner), but during trial testified that as many as 35 agreements were comparable to the hypothetical negotiation. (See Trial Transcript at 3198, 3208–13). According

³ TT seemingly abandons this argument, as well as its argument regarding foreign damages addressed below, in its reply brief. (See Dkt. 2228). Arguments abandoned in a reply brief are generally deemed waived. See e.g., *United States v. Farris*, 532 F.3d 615, 619 (7th Cir. 2008). In an effort to be thorough, however, the Court briefly addresses them nonetheless.

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to TT, this “surprise attack was contrary to law, because IB never showed—before trial or during trial—that any agreement but the three mentioned above were comparable.” (Dkt. 2138 at 13).

TT raised this exact issue during trial. (*See* Dkt. 2092). Rejecting TT’s motion to prevent Reed from relying on these alleged noncomparable agreements, the Court observed:

TT argues Reed cannot rely on noncomparable licensing agreements, i.e., those other than the PatSystems, Strategy Runner, and NinjaTrader agreements, to support his reasonable royalty assessment. As a threshold matter, this issue should have been raised in a *Daubert* motion, the deadline for which has long passed. Regardless, Reed does not use the agreements to support his ultimate reasonable royalty assessment. Rather, the agreements are used to show that the \$50 minimum and 10 cent royalty Lawton used in her royalty assessment are flawed. TT also argues that the manner in which Reed seeks to rely on the agreements was not disclosed in his report. Reed’s demonstrative slides indicate he will use the agreements to show that other competitors did not agree to pay a \$50 minimum/monthly fee or a 10 cent royalty. These opinions were adequately disclosed in Reed’s report. (*See* Dkt. 2099-2 at 194–196).

(Dkt. 2102).

The Court reiterates that Reed disclosed the relevance of the 35 agreements in his expert report, including tabs detailing the particulars of each agreement, well before trial. (Dkt. 2140 Ex. 21 at 194–96). Specifically, Reed used the agreements to provide context for his opinion that the 10 cent running royalty rate and \$50 minimum monthly fee that Lawton used for her royalty rate are flawed. *Id.* This testimony is consistent with Reed’s trial testimony. (*See* Trial Transcript at 3209–11, 3326–27, 3353–54). There was no surprise to TT here—it was on notice of Reed’s view that other agreements were comparable and relevant for purposes of evaluating the competing royalty rates advanced by the parties.⁴

⁴ It is notable that while the jury seemingly accepted Reed’s view that the \$50 monthly minimum fee should not be included as part of the royalty calculation, the jury rejected his view that a 5 cent royalty rate was appropriate, opting instead to award damages at the 10 cent royalty rate advanced by Lawton. *Compare* (Dkt. 2134) (jury award of \$6,610,985) with (Trial Transcript at 3330, 3273) (Reed testifying that at a reasonable royalty rate of 10 cents per user in the United States, based on the amount of IB customers who actually used Book Trader, the damages amount would be \$6,610,985). Thus, the effect of testimony about these other agreements was not as harmful to TT’s position as it advances.

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TT takes particular issue with IB's use of the TD Ameritrade agreement at trial. TT moved to prevent Reed from testifying about the TD Ameritrade agreement in a *Daubert* motion. (Dkt. 1666). The Court found the issue was moot given that Reed relied on the agreement to support his conclusions regarding the 2010 hypothetical negotiation, which, at the time of the Court's ruling, was outside the scope of the case. (See Dkt. 1987 at 2). During trial, the Court prevented Reed from discussing this agreement in the context of the 2004 hypothetical negotiation, finding Reed had not adequately disclosed the relevance of the TD Ameritrade agreement to the 2004 negotiation. (See Trial Transcript at 3312). Notwithstanding this ruling, the Court allowed IB to argue the TD Ameritrade agreement's comparability during closing arguments given testimony from other witnesses at trial about the agreement, including TT's damages expert, Catherine Lawton. (See *id.* at 4015) (see also *id.* at 1116, 1186, 1224–25, 1791–93). Testimony regarding the comparability of the TD Ameritrade agreement, as well as the other licensing agreements, was highly relevant to two of the four *Georgia-Pacific* factors used to determine a reasonable royalty: “[t]he royalties received by the patent owner for the licensing of the patent-in-suit” and “[t]he licensor’s established policy and marketing program to maintain its patent monopoly by not licensing others to use the invention or by granting licenses under special conditions designed to preserve that monopoly.” *Georgia-Pac. Corp. v. U.S. Plywood Corp.*, 318 F. Supp. 1116, 1120 (S.D.N.Y. 1970). Although TT disputed the comparability of these agreements, it did not present evidence that the license agreements were “radically different from the hypothetical agreement under consideration” such that they warranted exclusion. *Uniloc USA, Inc. v. Microsoft Corp.*, 632 F.3d 1292, 1316 (Fed. Cir. 2011) (internal quotations and citation omitted). TT had the opportunity to, and did in fact, cross IB’s witnesses regarding these agreements and further presented *affirmative* evidence regarding their noncomparability. (See Trial Transcript at 3353–

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58, 3736–39). Contrary to TT’s assertion, IB’s reliance on the agreements was well disclosed and the Court did not err in permitting such testimony at trial.

III. Foreign Damages

Finally, TT moves for judgment as a matter of law that TT may recover for foreign damages proximately caused by IB’s domestic infringement.⁵ TT’s damages expert, Catherine Lawton, opined in her expert report that IB’s foreign conduct of distributing the infringing BookTrader tool to customers outside the United States was the direct, foreseeable result of IB’s domestic acts of infringements, *i.e.* making BookTrader at its headquarters in the United States. (Dkt. 2138 at Ex. 23, ¶ 768). In response to a *Daubert* motion filed by IB, the Court excluded Ms. Lawton’s opinion on this issue:

Generally, even after establishing one or more acts of infringement in the United States, a patentee may not recover damages for worldwide sales of the patented invention on the theory that “those foreign sales were the direct, foreseeable result of [the infringer’s] domestic infringement.” *Power Integrations, Inc. v. Fairchild Semiconductor Int’l, Inc.*, 711 F.3d 1348, 1371 (Fed. Cir. 2013). In *WesternGeco LLC v. ION Geophysical Corp.*, however, the Supreme Court held that a patent owner claiming infringement under 35 U.S.C. § 271(f)(2) may recover lost foreign profits proximately caused by domestic infringement. 138 S. Ct. 2129, 2139 (2018). As this Court has previously observed, however, the holding in *WesternGeco*, “is of limited value” to the present case involving infringement under § 271(a) and reasonable royalty damages. See *Trading Techs. Int’l, Inc. v. IB LLC*, No. 10 C 715, 2020 WL 7408745, at n.2 (N.D. Ill. Dec. 17, 2020). The Supreme Court and Federal Circuit have not yet held that *WesternGeco* overruled *PowerIntegrations* with respect to infringement under § 271(a), and the Court declines to reach that conclusion in the absence of such precedent. Lawton’s inclusion of foreign users in her royalty base premised on a theory of foreseeable foreign consequences of infringement is premised on a misapplication of controlling law. To the extent her ultimate conclusion relies on this theory, it must be excluded.

(Dkt. 1984 at 3). TT argues the “Court’s *Daubert* ruling was harmful error because the jury was precluded from hearing Ms. Lawton’s opinion that, under *WesternGeco*, the activities of foreign residents caused foreseeable injury to TT arising from IB’s domestic infringement.” (Dkt. 2138 at

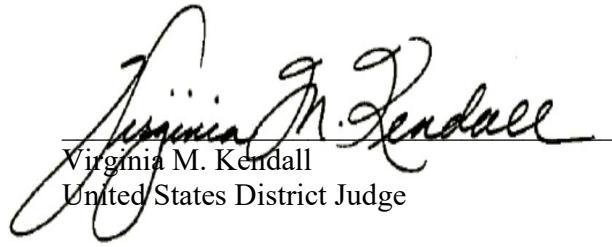
⁵ TT also abandoned this argument in its reply brief. (See Dkt. 2228); *see supra* note 3.

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14). The legal landscape since this Court's *Daubert* opinion, however, has not changed. While some courts have extended the reasoning in *WesternGeco* to § 271(a) infringement, *see e.g.*, *CelaNova Biosciences Inc.*, No. 1:18-CV-303-LY, 2020 WL 1644003, at *3 (E.D. Tex. April 2, 2020), there is still no federal precedent holding that *WesternGeco* overruled previous Federal Circuit precedent with respect to damages available for § 271(a) infringement. Notably, infringement under § 271(f), unlike infringement under § 271(a), explicitly contemplates limited foreign activities that are actionable in the United States. (*See* 35 U.S.C. § 271(f)). Several courts to consider the issue have agreed that *Power Integrations* and its progeny remain binding precedent even after *WesternGeco*. *See e.g.*, *LC Intell. Prop. v. Micron Tech., Inc.*, No. 14-cv-03657, 2019 WL 2437073, at *3 (N.D. Cal. June 11, 2019) (“[W]hether ... [*WesternGeco*] implicitly overruled [*Power Integrations*] remains to be seen, but at this time controlling law holds that [plaintiff] may not seek damages under § 271(a) based on [defendant]’s wholly foreign sales.”); *Abbott Cardiovascular Sys., Inc. v. Edwards Lifesciences Corp.*, No. CV 19-149 (MN), 2019 WL 2521305, at *18 (D. Del. June 6, 2019); *Kajeet, Inc. v. Qustodio, LLC*, No. SA CV 18-1519-JAK (PLAX), 2019 WL 8060078, at *13 (C.D. Cal. Oct. 22, 2019); *California Inst. of Tech. v. Broadcom Ltd.*, No. CV 16-3714-GW(AGR), 2019 WL 11828237, at *5 (C.D. Cal. June 17, 2019). For these reasons, the Court's *Daubert* ruling excluding testimony regarding entirely foreign sales and resultant damages remains sound.

CONCLUSION

For the foregoing reasons, TT's motion for new trial [2138] is denied.



Virginia M. Kendall
United States District Judge

Date: February 22, 2022



US006772132B1

(12) **United States Patent**
Kemp, II et al.

(10) **Patent No.:** US 6,772,132 B1
(45) **Date of Patent:** Aug. 3, 2004

(54) **CLICK BASED TRADING WITH INTUITIVE GRID DISPLAY OF MARKET DEPTH**

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(List continued on next page.)

(73) Assignee: **Trading Technologies International, Inc.**, Chicago, IL (US)

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(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 245 days.

(21) Appl. No.: 09/590,692

(22) Filed: Jun. 9, 2000

Related U.S. Application Data

(60) Provisional application No. 60/186,322, filed on Mar. 2, 2000.

(51) Int. Cl.⁷ G06F 17/60

(52) U.S. Cl. 705/37; 705/35; 705/36; 705/37; 705/10; 705/14; 345/814

(58) Field of Search 705/35, 36, 37, 705/10, 14; 345/814

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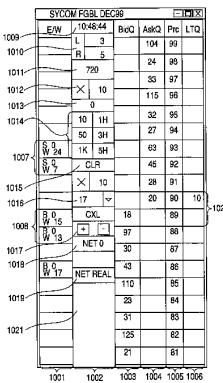
Primary Examiner—Richard Weisberger

(74) Attorney, Agent, or Firm—Foley & Lardner

(57) ABSTRACT

A method and system for reducing the time it takes for a trader to place a trade when electronically trading on an exchange, thus increasing the likelihood that the trader will have orders filled at desirable prices and quantities. The “Mercury” display and trading method of the present invention ensure fast and accurate execution of trades by displaying market depth on a vertical or horizontal plane, which fluctuates logically up or down, left or right across the plane as the market prices fluctuates. This allows the trader to trade quickly and efficiently.

56 Claims, 6 Drawing Sheets



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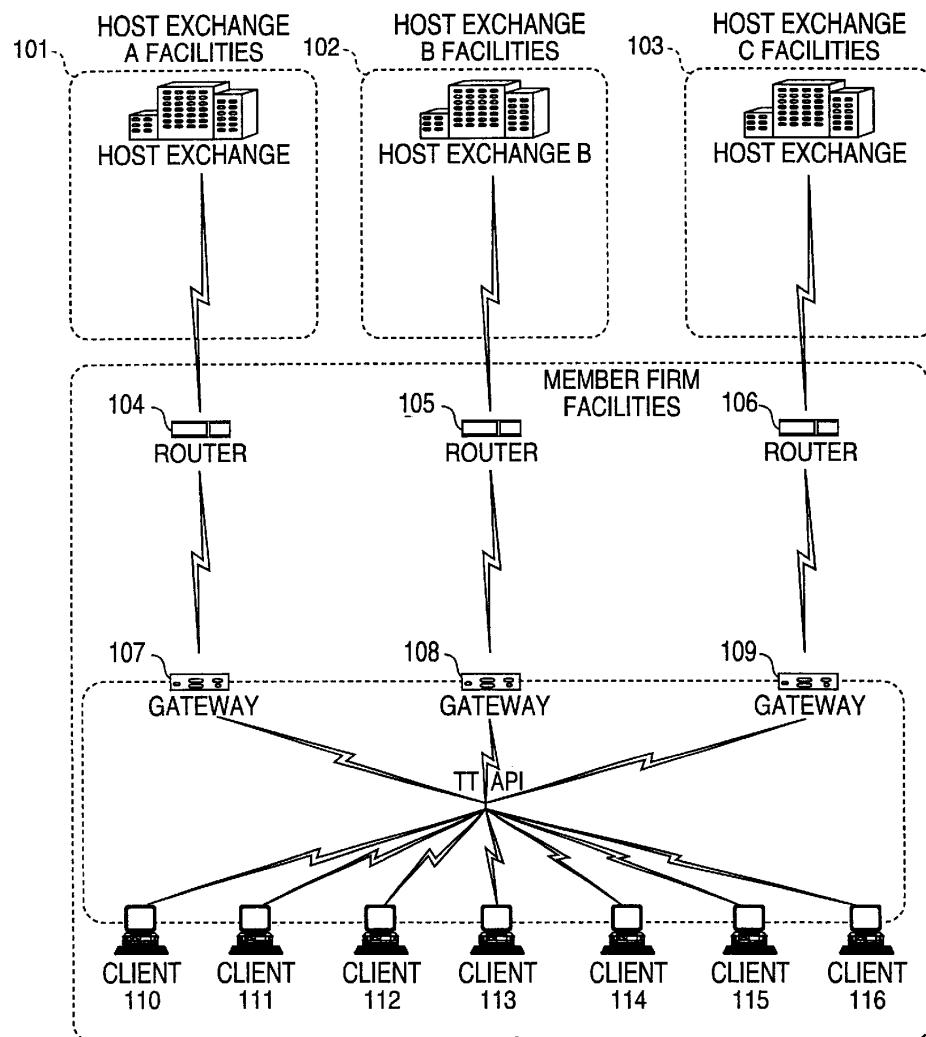
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FIG. 1

CONNECTION TO MULTIPLE EXCHANGES



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FIG. 2

201 202 203 204 205

Contract	Depth	BidQty	BidPrc	AskPrc	AskQty	LastPrc	LastQty	Total
1 CDHO	•	785	7626	7627	21	7627	489	8230
2		626	7625	7629	815			
3		500	7624	7630	600			
4		500	7623	7631	2456			
5		200	7622	7632	800			

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FIG. 3

SYCOM FGBL DEC99

	E/W	10:48:44	BidQ	AskQ	Prc	LTQ
1009	L	3		104	99	
1010	R	5		24	98	
1011	720			33	97	
1012	X	10		115	96	
1013	0			32	95	
1014	10	1H		27	94	
	50	3H		63	93	
1007	S 0 W 24	1K 5H		45	92	
	S 0 W 7	CLR				
1015	X	10		28	91	
1016	17	▼		20	90	10
1008	B 0 W 15	CXL	18		89	
	B 0 W 13	[+]	97		88	
1017	NET 0		30		87	
1018	B 0 W 17	NET REAL	43		86	
1019			110		85	
1021			23		84	
			31		83	
			125		82	
			21		81	
			1001	1002	1003	1004
			1005	1006		

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FIG. 4

SYCOM FGBL DEC99

E/W	10:48:44		BidQ	AskQ	Prc	LTQ
	L	3		104	99	
	R	5		24	98	
	720			33	97	
	X	10		115	96	
	0			32	95	
	10	1H		27	94	
	50	3H		63	93	10
S 10 W 14	1K	5H	43		92	
	CLR		125		91	
	X	10	97		90	
	17	▼		18	89	
B 0 W 15	CXL		97		88	
B 0 W 13	[+]	-		30	87	
	NET 0			43	86	
B 0 W 17	NET REAL			110	85	
				23	84	
				31	83	
				125	82	
				21	81	

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FIG. 5

SYCOM FGBL DEC99

E/W	10:48:44	BidQ	AskQ	Prc	LTQ
L	3		104	99	
R	5		24	98	
	720		33	97	
X	10		115	96	
	0		32	95	
10	1H		27	94	
50	3H		63	93	
S 0 W 24	1K 5H		45	92	
S 0 W 7	CLR		28	91	
	X 10		20	90	10
17	▼		18		89
B 0 W 15	CXL		97		88
B 0 W 13	+ -		30		87
	NET 0		43		86
B 0 W 17	NET REAL		110		85
			23		84
			31		83
			125		82
			21		81

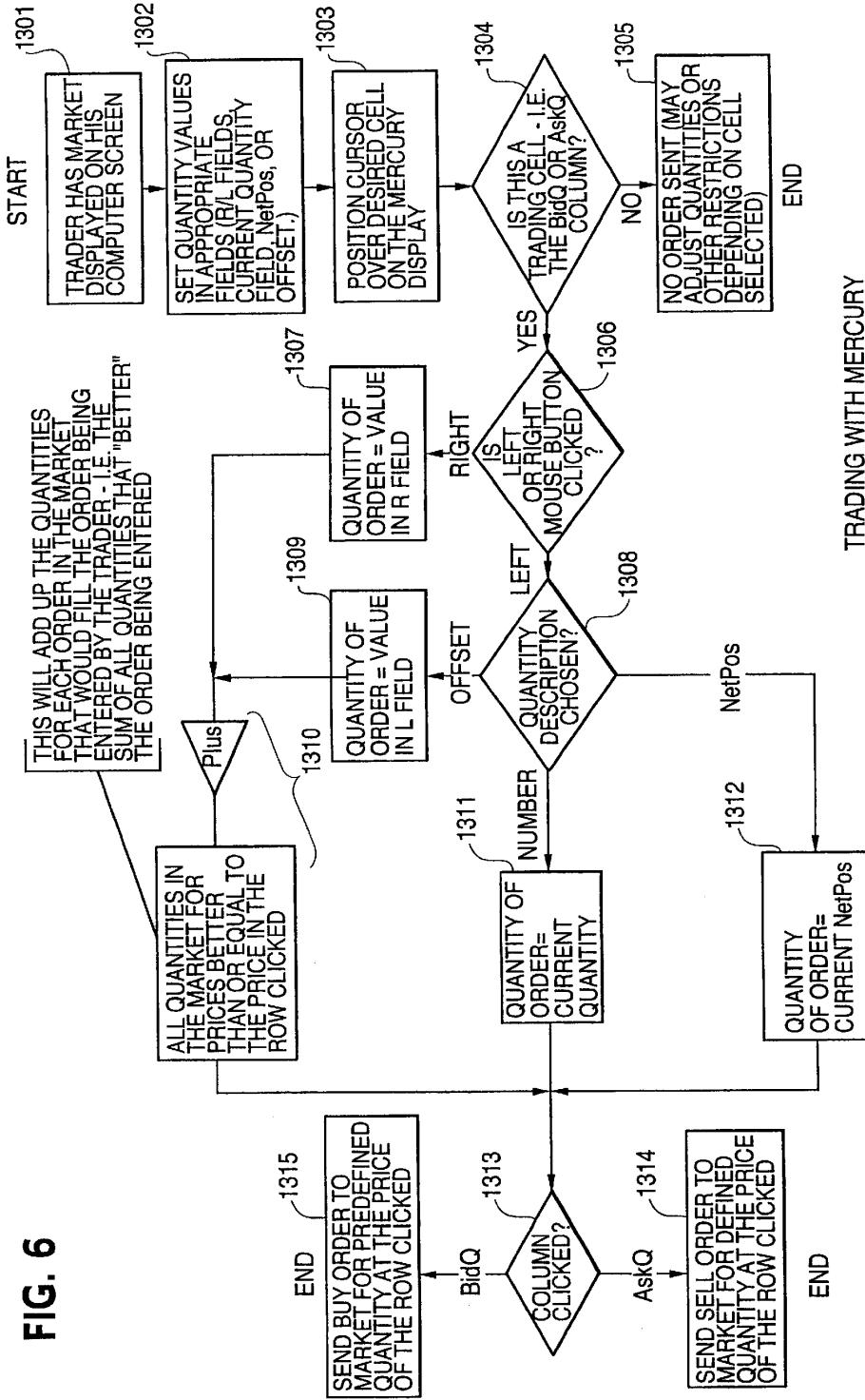
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1**CLICK BASED TRADING WITH INTUITIVE GRID DISPLAY OF MARKET DEPTH****PRIORITY**

The present application claims priority to a U.S. Provisional Patent Application No. 60/186,322 entitled "Market Depth Display Click Based Trading and Mercury Display" filed Mar. 2, 2000, the contents of which are incorporated herein by reference.

FIELD OF INVENTION

The present invention is directed to the electronic trading of commodities. Specifically, the invention provides a trader with a versatile and efficient tool for executing trades. It facilitates the display of and the rapid placement of trade orders within the market trading depth of a commodity, where a commodity includes anything that can be traded with quantities and/or prices.

BACKGROUND OF THE INVENTION

At least 60 exchanges throughout the world utilize electronic trading in varying degrees to trade stocks, bonds, futures, options and other products. These electronic exchanges are based on three components: mainframe computers (host), communications servers, and the exchange participants' computers (client). The host forms the electronic heart of the fully computerized electronic trading system. The system's operations cover order-matching, maintaining order books and positions, price information, and managing and updating the database for the online trading day as well as nightly batch runs. The host is also equipped with external interfaces that maintain uninterrupted online contact to quote vendors and other price information systems.

Traders can link to the host through three types of structures: high speed data lines, high speed communications servers and the Internet. High speed data lines establish direct connections between the client and the host. Another connection can be established by configuring high speed networks or communications servers at strategic access points worldwide in locations where traders physically are located. Data is transmitted in both directions between traders and exchanges via dedicated high speed communication lines. Most exchange participants install two lines between the exchange and the client site or between the communication server and the client site as a safety measure against potential failures. An exchange's internal computer system is also often installed with backups as a redundant measure to secure system availability. The third connection utilizes the Internet. Here, the exchange and the traders communicate back and forth through high speed data lines, which are connected to the Internet. This allows traders to be located anywhere they can establish a connection to the Internet.

Irrespective of the way in which a connection is established, the exchange participants' computers allow traders to participate in the market. They use software that creates specialized interactive trading screens on the traders' desktops. The trading screens enable traders to enter and execute orders, obtain market quotes, and monitor positions. The range and quality of features available to traders on their screens varies according to the specific software application being run. The installation of open interfaces in the development of an exchange's electronic strategy means users can choose, depending on their trading style and internal requirements, the means by which they will access the exchange.

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The world's stock, bond, futures and options exchanges have volatile products with prices that move rapidly. To profit in these markets, traders must be able to react quickly. A skilled trader with the quickest software, the fastest communications, and the most sophisticated analytics can significantly improve his own or his firm's bottom line. The slightest speed advantage can generate significant returns in a fast moving market. In today's securities markets, a trader lacking a technologically advanced interface is at a severe competitive disadvantage.

Irrespective of what interface a trader uses to enter orders in the market, each market supplies and requires the same information to and from every trader. The bids and asks in the market make up the market data and everyone logged on to trade can receive this information if the exchange provides it. Similarly, every exchange requires that certain information be included in each order. For example, traders must supply information like the name of the commodity, quantity, restrictions, price and multiple other variables. Without all of this information, the market will not accept the order. This input and output of information is the same for every trader.

With these variables being constant, a competitive speed advantage must come from other aspects of the trading cycle. When analyzing the time it takes to place a trade order for a given commodity, various steps contribute in different amounts to the total time required. Approximately 8% of the total time it takes to enter an order elapses between the moment the host generates the price for the commodity and the moment the client receives the price. The time it takes for the client application to display the price to the trader amounts to approximately 4%. The time it takes for a trade order to be transmitted to the host amounts to approximately 8%. The remainder of the total time it takes to place an order, approximately 80%, is attributable to the time required for the trader to read the prices displayed and to enter a trade order. The present invention provides a significant advantage during the slowest portion of the trading cycle—while the trader manually enters his order. Traders recognize that the value of time savings in this portion may amount to millions of dollars annually.

In existing systems, multiple elements of an order must be entered prior to an order being sent to market, which is time consuming for the trader. Such elements include the commodity symbol, the desired price, the quantity and whether a buy or a sell order is desired. The more time a trader takes entering an order, the more likely the price on which he wanted to bid or offer will change or not be available in the market. The market is fluid as many traders are sending orders to the market simultaneously. In fact, successful markets strive to have such a high volume of trading that any trader who wishes to enter an order will find a match and have the order filled quickly, if not immediately. In such liquid markets, the prices of the commodities fluctuate rapidly. On a trading screen, this results in rapid changes in the price and quantity fields within the market grid. If a trader intends to enter an order at a particular price, but misses the price because the market prices moved before he could enter the order, he may lose hundreds, thousands, even millions of dollars. The faster a trader can trade, the less likely it will be that he will miss his price and the more likely he will make money.

SUMMARY OF THE INVENTION

The inventors have developed the present invention which overcomes the drawbacks of the existing trading systems

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and dramatically reduces the time it takes for a trader to place a trade when electronically trading on an exchange. This, in turn, increases the likelihood that the trader will have orders filled at desirable prices and quantities.

The "Mercury" display and trading method of the present invention ensure fast and accurate execution of trades by displaying market depth on a vertical or horizontal plane, which fluctuates logically up or down, left or right across the plane as the market prices fluctuate. This allows the trader to trade quickly and efficiently.

Specifically, the present invention is directed to a graphical user interface for displaying the market depth of a commodity traded in a market, including a dynamic display for a plurality of bids and for a plurality of asks in the market for the commodity and a static display of prices corresponding to the plurality of bids and asks. In this embodiment the pluralities of bids and asks are dynamically displayed in alignment with the prices corresponding thereto. Also described herein is a method and system for placing trade orders using such displays.

These embodiments, and others described in greater detail herein, provide the trader with improved efficiency and versatility in placing, and thus executing, trade orders for commodities in an electronic exchange. Other features and advantages of the present invention will become apparent to those skilled in the art from the following detailed description. It should be understood, however, that the detailed description and specific examples, while indicating preferred embodiments of the present invention, are given by way of illustration and not limitation. Many changes and modifications within the scope of the present invention may be made without departing from the spirit thereof, and the invention includes all such modifications.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 illustrates the network connections between multiple exchanges and client sites;

FIG. 2 illustrates screen display showing the inside market and the market depth of a given commodity being traded;

FIG. 3 illustrates the Mercury display of the present invention;

FIG. 4 illustrates the Mercury display at a later time showing the movement of values when compared to FIG. 3;

FIG. 5 illustrates a Mercury display with parameters set in order to exemplify the Mercury trading method; and

FIG. 6 is a flowchart illustrating the process for Mercury display and trading.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

As described with reference to the accompanying figures, the present invention provides a display and trading method to ensure fast and accurate execution of trades by displaying market depth on a vertical or horizontal plane, which fluctuates logically up or down, left or right across the plane as the market prices fluctuate. This allows the trader to place trade orders quickly and efficiently. A commodity's market depth is the current bid and ask prices and quantities in the market. The display and trading method of the invention increase the likelihood that the trader will be able to execute orders at desirable prices and quantities.

In the preferred embodiment, the present invention is implemented on a computer or electronic terminal. The computer is able to communicate either directly or indirectly (using intermediate devices) with the exchange to receive

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and transmit market, commodity, and trading order information. It is able to interact with the trader and to generate contents and characteristics of a trade order to be sent to the exchange. It is envisioned that the system of the present invention can be implemented on any existing or future terminal or device with the processing capability to perform the functions described herein. The scope of the present invention is not limited by the type of terminal or device used. Further, the specification refers to a single click of a mouse as a means for user input and interaction with the terminal display as an example of a single action of the user. While this describes a preferred mode of interaction, the scope of the present invention is not limited to the use of a mouse as the input device or to the click of a mouse button as the user's single action. Rather, any action by a user within a short period of time, whether comprising one or more clicks of a mouse button or other input device, is considered a single action of the user for the purposes of the present invention.

The system can be configured to allow for trading in a single or in multiple exchanges simultaneously. Connection of the system of the present invention with multiple exchanges is illustrated in FIG. 1. This figure shows multiple host exchanges 101-103 connected through routers 104-106 to gateways 107-109. Multiple client terminals 110-116 for use as trading stations can then trade in the multiple exchanges through their connection to the gateways 107-109. When the system is configured to receive data from multiple exchanges, then the preferred implementation is to translate the data from various exchanges into a simple format. This "translation" function is described below with reference to FIG. 1. An applications program interface ("TT API" as depicted in the figure) translates the incoming data formats from the different exchanges to a simple preferred data format. This translation function may be disposed anywhere in the network, for example, at the gateway server, at the individual workstations or at both. In addition, the storage at gateway servers and at the client workstations, and/or other external storage cache historical data such as order books which list the client's active orders in the market; that is, those orders that have neither been filled nor cancelled. Information from different exchanges can be displayed at one or in multiple windows at the client workstation. Accordingly, while reference is made through the remainder of the specification to a single exchange to which a trading terminal is connected, the scope of the invention includes the ability to trade, in accordance with the trading methods described herein, in multiple exchanges using a single trading terminal.

The preferred embodiments of the present invention include the display of "Market Depth" and allow traders to view the market depth of a commodity and to execute trades within the market depth with a single click of a computer mouse button. Market Depth represents the order book with the current bid and ask prices and quantities in the market. In other words, Market Depth is each bid and ask that was entered into the market, subject to the limits noted below, in addition to the inside market. For a commodity being traded, the "inside market" is the highest bid price and the lowest ask price.

The exchange sends the price, order and fill information to each trader on the exchange. The present invention processes this information and maps it through simple algorithms and mapping tables to positions in a theoretical grid program or any other comparable mapping technique for mapping data to a screen. The physical mapping of such information to a screen grid can be done by any technique

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known to those skilled in the art. The present invention is not limited by the method used to map the data to the screen display.

How far into the market depth the present invention can display depends on how much of the market depth the exchange provides. Some exchanges supply an infinite market depth, while others provide no market depth or only a few orders away from the inside market. The user of the present invention can also chose how far into the market depth to display on his screen.

FIG. 2 illustrates a screen display of an invention described in a commonly owned co-pending application entitled "Click Based Trading with Market Depth Display" Ser. No. 09/589,751, filed on Jun. 9, 2000, the contents of which are incorporated herein by reference. This display shows the inside market and the market depth of a given commodity being traded. Row 1 represents the "inside market" for the commodity being traded which is the best (highest) bid price and quantity and the best (lowest) ask price and quantity. Rows 2-5 represent the "market depth" for the commodity being traded. In the preferred embodiment of the present invention, the display of market depth (rows 2-5) lists the available next-best bids, in column 203, and asks, in column 204. The working bid and ask quantity for each price level is also displayed in columns 202 and 205 respectively (inside market—row 1). Prices and quantities for the inside market and market depth update dynamically on a real time basis as such information is relayed from the market.

In the screen display shown in FIG. 2, the commodity (contract) being traded is represented in row 1 by the character string "CDHO". The Depth column 208 will inform the trader of a status by displaying different colors. Yellow indicates that the program application is waiting for data. Red indicates that the Market Depth has failed to receive the data from the server and has "timed out." Green indicates that the data has just been updated. The other column headings in this and all of the other figures, are defined as follows. BidQty (Bid Quantity): the quantity for each working bid, BidPrc (Bid Price): the price for each working bid, AskPrc (Ask Price): the price for each working ask, AskQty (Ask Quantity): the quantity for each working ask, LastPrc (Last Price): the price for the last bid and ask that were matched in the market and LastQty (Last Quantity): the quantity traded at the last price. Total represents the total quantity traded of the given commodity.

The configuration of the screen display itself informs the user in a more convenient and efficient manner than existing systems. Traders gain a significant advantage by seeing the market depth because they can see trends in the orders in the market. The market depth display shows the trader the interest the market has in a given commodity at different price levels. If a large amount of bids or asks are in the market near the trader's position, he may feel he should sell or buy before the inside market reaches the morass of orders. A lack of orders above or below the inside market might prompt a trader to enter orders near the inside market. Without seeing the market depth, no such strategies could be utilized. Having the dynamic market depth, including the bid and ask quantities and prices of a traded commodity aligned with and displayed below the current inside market of the commodity conveys the information to the user in a more intuitive and easily understandable manner. Trends in the trading of the commodity and other relevant characteristics are more easily identifiable by the user through the use of the present invention.

Various abbreviations are used in the screen displays, and specifically, in the column headings of the screen displays

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reproduced herein. Some abbreviations have been discussed above. A list of common abbreviations and their meanings is provided in Table 1.

TABLE I

COLUMN	DESCRIPTION	Abbreviations
Month	Expiration Month/Year	
Bid Mbr ₍₁₎	Bid Member ID	
WrkBuys ₍₂₎	Working Buys for entire Group	
ID	ID	
BidQty	Bid Quantity	
ThrshBid ₍₆₎	Threshold Bid Price	
BidPrc	Bid Price	
Bid Qty Accum	Accumulated Bid Quantity	
BidPrc Avg	Bid Price Average	
AskPrc Avg	Ask Price Average	
AskQty Accum	Accumulated Ask Quantity	
AskPrc	Ask Price	
ThrshAsk ₍₆₎	Threshold Ask Price	
AskQty	Ask Quantity	
WrkSells ₍₂₎	Working Sells for entire Group	
ID	ID	
Ask Mbr ₍₁₎	Ask Member ID	
NetPos	Net Position	
FFNetPos	Fast Fill Net Position	
LastPrc	Last Price	
LastQty	Last Quantity	
Total	Total Traded Quantity	
High	High Price	
Low	Low Price	
Open	Opening Price	
Close	Closing Price	
Chng	Last Price-Last Close	
TheoPrc	Theoretical Price	
TheoBid	Theoretical Bid Price	
TheoAsk	Theoretical Ask Price	
QAct	Quote Action (Sends individual quotes)	
BQQ	Test Bid Quote Quantity	
BQP	Test Bid Quote Price	
Mkt BQQ	Market Bid Quote Quantity	
Mkt BQP	Market Bid Quote Price	
Quote	Checkbox activates/deactivates contract for quoting	
Mkt AQQ	Market Ask Quote Quantity	
Mkt AQP	Market Ask Quote Price	
AQP	Ask Quote Price	
AQQ	Ask Quote Quantity	
Imp BidQty ₍₅₎	Implied Bid Quantity	
Imp BidPrc ₍₅₎	Implied Bid Price	
Imp AskQty ₍₅₎	Implied Ask Quantity	
Imp AskPrc ₍₅₎	Implied Ask Price	
Gamma ₍₃₎	Change in Delta given 1 pt change in underlying	
Delta ₍₃₎	Change in price given 1 pt change in underlying	
Vola ₍₃₁₎	Percent volatility	
Vega ₍₃₎	Price change given 1% change in Vola	
Rho ₍₃₎	Price change given 1% change in interest rate	
Theta ₍₃₎	Price change for every day that elapses	
Click Trd	Activate/deactivate click trading by contract	
S(Status)	Auction, Closed, FastMkt, Not Tradable, Pre-trading, Tradable, S = post-trading	
Expiry	Expiration Month/Year	

As described herein, the display and trading method of the present invention provide the user with certain advantages over systems in which a display of market depth, as shown in FIG. 2, is used. The Mercury display and trading method of the present invention ensure fast and accurate execution of trades by displaying market depth on a vertical or

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horizontal plane, which fluctuates logically up or down, left or right across the plane as the market prices fluctuates. This allows the trader to trade quickly and efficiently. An example of such a Mercury display is illustrated in the screen display of FIG. 3.

The display of market depth and the manner in which traders trade within the market depth can be effected in different manners, which many traders will find materially better, faster and more accurate. In addition, some traders may find the display of market depth to be difficult to follow. In the display shown in FIG. 2, the market depth is displayed vertically so that both Bid and Ask prices descend the grid. The Bid prices descend the market grid as the prices decrease. Ask prices also descend the market grid as these prices actually increase. This combination may be considered counterintuitive and difficult to follow by some traders.

The Mercury display overcomes this problem in an innovative and logical manner. Mercury also provides an order entry system, market grid, fill window and summary of market orders in one simple window. Such a condensed display materially simplifies the trading system by entering and tracking trades in an extremely efficient manner. Mercury displays market depth in a logical, vertical fashion or horizontally or at some other convenient angle or configuration. A vertical field is shown in the figures and described for convenience, but the field could be horizontal or at an angle. In turn, Mercury further increases the speed of trading and the likelihood of entering orders at desired prices with desired quantities. In the preferred embodiment of the invention, the Mercury display is a static vertical column of prices with the bid and ask quantities displayed in vertical columns to the side of the price column and aligned with the corresponding bid and ask prices. An example of this display is shown in FIG. 3.

Bid quantities are in the column 1003 labeled BidQ and ask quantities are in column 1004 labeled AskQ. The representative ticks from prices for the given commodity are shown in column 1005. The column does not list the whole prices (e.g. 95.89), but rather, just the last two digits (e.g. 89). In the example shown, the inside market, cells 1020, is 18 (best bid quantity) at 89 (best bid price) and 20 (best ask quantity) at 90 (best ask price). In the preferred embodiment of the invention, these three columns are shown in different colors so that the trader can quickly distinguish between them.

The values in the price column are static; that is, they do not normally change positions unless a re-centering command is received (discussed in detail later). The values in the Bid and Ask columns however, are dynamic; that is, they move up and down (in the vertical example) to reflect the market depth for the given commodity. The LTQ column 1006 shows the last traded quantity of the commodity. The relative position of the quantity value with respect to the Price values reflects the price at which that quantity was traded. Column 1001 labeled E/W (entered/working) displays the current status of the trader's orders. The status of each order is displayed in the price row where it was entered. For example, in cells 1007, the number next to S indicates the number of the trader's ordered lots that have been sold at the price in the specific row. The number next to W indicates the number of the trader's ordered lots that are in the market, but have not been filled—i.e. the system is working on filling the order. Blanks in this column indicate that no orders are entered or working at that price. In cells 1008, the number next to B indicates the number of the trader's ordered lots that have been bought at the price in the specific row. The number next to W indicates the number of

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the trader's ordered lots that are in the market, but have not been filled—i.e. the system is working on filling the order.

Various parameters are set and information is provided in column 1002. For example, “10:48:44” in cell 1009 shows the actual time of day. The L and R fields in cell 1010 indicate a quantity value, which may be added to the order quantity entered. This process is explained below with respect to trading under Mercury. Below the L and R fields, in cell 1011, a number appears which represents the current market volume. This is the number of lots that have been traded for the chosen contract. Cell 1012, “X 10”, displays the Net Quantity, the current position of the trader on the chosen contract. The number “10” represents the trader's buys minus sells. Cell 1013 is the “Current Quantity”; this field represents the quantity for the next order that the trader will send to market. This can be adjusted with right and left clicks (up and down) or by clicking the buttons which appear below the Current Quantity in cells 1014. These buttons increase the current quantity by the indicated amount; for example, “10” will increase it by 10; “1H” will increase it by 100; “1K” will increase it by 1000. Cell 1015 is the Clear button; clicking this button will clear the Current Quantity field. Cell 1016 is the Quantity Description; this is a pull down menu allowing the trader to chose from three Quantity Descriptions. The pull down menu is displayed when the arrow button in the window is clicked. The window includes NetPos, Offset and a field allowing the trader to enter numbers. Placing a number in this field will set a default buy or sell quantity. Choosing “Offset” in this field will enable the L/R buttons of cell 1010. Choosing “NetPos” in this field will set the current Net Quantity (trader's net position) as the trader's quantity for his next trade. Cell 1017 are +/-buttons; these buttons will alter the size of the screen—either larger (+) or smaller (-). Cell 1018 is used to invoke Net 0; clicking this button will reset the Net Quantity (cell 1011) to zero. Cell 1019 is used to invoke Net Real; clicking this button will reset the Net Quantity (cell 1011) to its actual position.

The inside market and market depth ascend and descend as prices in the market increase and decrease. For example, FIG. 4 shows a screen displaying the same market as that of FIG. 3 but at a later interval where the inside market, cells 1101, has risen three ticks. Here, the inside market for the commodity is 43 (best bid quantity) at 92 (best bid price) and 63 (best ask quantity) at 93 (best ask price). In comparing FIGS. 3 and 4, it can be seen that the price column remained static, but the corresponding bids and asks rose up the price column. Market Depth similarly ascends and descends the price column, leaving a vertical history of the market.

As the market ascends or descends the price column, the inside market might go above or below the price column displayed on a trader's screen. Usually a trader will want to be able to see the inside market to assess future trades. The system of the present invention addresses this problem with a one click centering feature. With a single click at any point within the gray area, 1021, below the “Net Real” button, the system will re-center the inside market on the trader's screen. Also, when using a three-button mouse, a click of the middle mouse button, irrespective of the location of the mouse pointer, will re-center the inside market on the trader's screen.

The same information and features can be displayed and enabled in a horizontal fashion. Just as the market ascends and descends the vertical Mercury display shown in FIGS. 3 and 4, the market will move left and right in the horizontal Mercury display. The same data and the same information gleaned from the dynamical display of the data is provided. It is envisioned that other orientations can be used to

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dynamically display the data and such orientations are intended to come within the scope of the present invention.

Next, trading commodities, and specifically, the placement of trade orders using the Mercury display is described. Using the Mercury display and trading method, a trader would first designate the desired commodity and, if applicable, the default quantities. Then he can trade with single clicks of the right or left mouse button. The following equations are used by the system to generate trade orders and to determine the quantity and price to be associated with the trade order. The following abbreviations are used in these formulas: P=Price value of row clicked, R=Value in R field, L=Value in L field, Q=Current Quantity, Q_a =Total of all quantities in AskQ column at an equal or better price than P, Q_b =Total of all quantities in BidQ column at an equal or better price than P, N=Current Net Position, Bo=Buy order sent to market and So=Sell order sent to market.

Any order entered using right mouse button

$$Bo = (Q_a + R)P \quad (\text{Eq. 1})$$

If BidQ field clicked.

$$So = (Q_b + R)P \quad (\text{Eq. 2})$$

If AskQ field clicked.

Orders entered using the left mouse button

If "Offset" mode chosen in Quantity Description field then:

$$Bo = (Q_a + L)P \quad (\text{Eq. 3})$$

If BidQ field clicked.

$$So = (Q_b + L)P \quad (\text{Eq. 4})$$

If AskQ field clicked.

If "number" mode chosen in Quantity Description field then:

$$Bo = QP \quad (\text{Eq. 5})$$

$$So = QP \quad (\text{Eq. 6})$$

If "NetPos" mode chosen in Quantity Description field then:

$$Bo = NP \quad (\text{Eq. 7})$$

$$So = NP \quad (\text{Eq. 8})$$

Orders can also be sent to market for quantities that vary according to the quantities available in the market; quantities preset by the trader; and which mouse button the trader clicks. Using this feature, a trader can buy or sell all of the bids or asks in the market at or better than a chosen price with one click. The trader could also add or subtract a preset quantity from the quantities outstanding in the market. If the trader clicks in a trading cell—i.e. in the BidQ or AskQ column, he will enter an order in the market. The parameters of the order depend on which mouse button he clicks and what preset values he set.

Using the screen display and values from FIG. 5, the placement of trade orders using the Mercury display and trading method is now described using examples. A left click on the 18 in the BidQ column 1201 will send an order to market to sell 17 lots (quantity # chosen on the Quantity Description pull down menu cell 1204) of the commodity at a price of 89 (the corresponding price in the Prc column

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1203). Similarly, a left click on the 20 in the AskQ column 1202 will send an order to market to buy 17 lots at a price of 90.

Using the right mouse button, an order would be sent to market at the price that corresponds to the row clicked for the total quantity of orders in the market that equal or better the price in that row plus the quantity in the R field 1205. Thus, a right click in the AskQ column 1202 in the 87 price row will send a sell order to market at a price of 87 and a quantity of 150. 150 is the sum of all the quantities 30, 97, 18 and 5. 30, 97 and 18 are all of the quantities in the market that would meet or better the trader's sell order price of 87. These quantities are displayed in the BidQ column 1201 because this column represents the orders outstanding in the market to purchase the commodity at each corresponding price. The quantity 5 is the quantity pre-set in the R field 1205.

Similarly, a right click in the BidQ column 1201 at the same price level of 87 would send a buy limit order to market for a quantity of 5 at a price of 87. The quantity is determined in the same manner as above. In this example, though, there are no orders in the market that equal or better the chosen price—there are no quantities in the AskQ column 1202 that equal or better this price. Therefore, the sum of the equal or better quantities is zero ("0"). The total order entered by the trader will be the value in the R field, which is 5.

An order entered with the left mouse button and the "Offset" option chosen in the quantity description field 1204 will be calculated in the same way as above, but the quantity in the L field 1206 will be added instead of the quantity in the R field 1205. Thus, a left click in the BidQ column 1201 in the 92 price row will send a buy order to market at a price of 92 and a quantity of 96. 96 is the sum of all the quantities 45, 28, 20 and 3. 45, 28 and 20 are all quantities in the market that would meet or better the trader's buy order price of 92. These quantities are displayed in the AskQ column 1202 because this column represents the orders outstanding in the market to sell the commodity at each corresponding price. The quantity 3 is the quantity pre-set in the L field 1206.

The values in the L or R fields may be negative numbers. This would effectively decrease the total quantity sent to market. In other words, in the example of a right click in the AskQ column 1202 in the 87 price row, if the R field was -5, the total quantity sent to market would be 140 (30+97+18+(-5)).

If a trader chose the "NetPos" option in the quantity description field 1204, a right click would still work as explained above. A left click would enter an order with a price corresponding to the price row clicked and a quantity equal to the current Net position of the trader. The Net position of the trader is the the trader's current position on the chosen contract. In other words, if the trader has bought 10 more contracts than he has sold, this value would be 10. NetPos would not affect the quantity of an order sent with a right click.

If the trader chose a number value in the quantity description, a left click would send an order to market for the current quantity chosen by the trader. The default value of the current quantity will be the number entered in the quantity description field, but it could be changed by adjusting the figure in the current quantity field 1204.

This embodiment of the invention also allows a trader to delete all of his working trades with a single click of either the right or left mouse button anywhere in the last traded quantity (LTQ) column 1207. This allows a trader to exit the

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market immediately. Traders will use this feature when they are losing money and want to stop the losses from piling up. Traders may also use this feature to quickly exit the market upon making a desired profit. The invention also allows a trader to delete all of his orders from the market at a particular price level. A click with either mouse button in the Entered/Working (E/W) column **1208** will delete all working orders in the cell that was clicked. Thus, if a trader believes that previously sent orders at a particular price that have not been filled would be poor trades, he can delete these orders with a single click.

The process for placing trade orders using the Mercury display and trading method of the present invention as described above is shown in the flowchart of FIG. 6. First, in step **1301**, the trader has the Mercury display on the trading terminal screen showing the market for a given commodity. In step **1302**, the parameters are set in the appropriate fields, such as the L and R fields and the Current Quantity, NetPos or Offset fields from the pull down menu. In step **1303**, the mouse pointer is positioned and clicked over a cell in the Mercury display by the trader. In step **1304**, the system determines whether the cell clicked is a tradeable cell (i.e. in the AskQ column or BidQ column). If not, then in step **1305**, no trade order is created or sent and, rather, other quantities are adjusted or functions are performed based upon the cell selected. Otherwise, in step **1306**, the system determines whether it was the left or the right button of the mouse that was clicked. If it was the right, then in step **1307**, the system will use the quantity in the R field when it determines the total quantity of the order in step **1310**. If the left button was clicked, then in step **1308**, the system determines which quantity description was chosen: Offset, NetPos or an actual number.

If Offset was chosen, then the system, in step **1309**, will use the quantity in the L field when it determines the total quantity of the order in step **1310**. If NetPos was chosen, then the system, in step **1312**, will determine that the total quantity for the trade order will be current NetPos value, i.e. the net position of the trader in the given commodity. If an actual number was used as the quantity description, then, in step **1311**, the system will determine that the total quantity for the trade order will be the current quantity entered. In step **1310**, the system will determine that the total quantity for the trade order will be the value of the R field (if step **1307** was taken) or the value of the L field (if step **1309** was taken) plus all quantities in the market for prices better than or equal to the price in the row clicked. This will add up the quantities for each order in the market that will fill the order being entered by the trader (plus the L or R value).

After either steps **1310**, **1311** or **1312**, the system, in step **1313**, determines which column was clicked, BidQ or AskQ. If AskQ was clicked, then, in step **1314**, the system sends a sell limit order to the market at the price corresponding to the row for the total quantity as already determined. If BidQ was clicked, then, in step **1315**, the system sends a buy limit order to the market at the price corresponding to the row for the total quantity as already determined.

It should be understood that the above description of the invention and specific examples, while indicating preferred embodiments of the present invention, are given by way of illustration and not limitation. Many changes and modifications within the scope of the present invention may be made without departing from the spirit thereof, and the present invention includes all such changes and modifications.

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We claim:

1. A method of placing a trade order for a commodity on an electronic exchange having an inside market with a highest bid price and a lowest ask price, using a graphical user interface and a user input device, said method comprising:

setting a preset parameter for the trade order

displaying market depth of the commodity, through a dynamic display of a plurality of bids and a plurality of asks in the market for the commodity, including at least a portion of the bid and ask quantities of the commodity, the dynamic display being aligned with a static display of prices corresponding thereto, wherein the static display of prices does not move in response to a change in the inside market;

displaying an order entry region aligned with the static display prices comprising a plurality of areas for receiving commands from the user input devices to send trade orders, each area corresponding to a price of the static display of prices; and

selecting a particular area in the order entry region through single action of the user input device with a pointer of the user input device positioned over the particular area to set a plurality of additional parameters for the trade order and send the trade order to the electronic exchange.

2. A method of placing a trade order according to claim 1, wherein said trade order is a buy order if the position of the pointer at the time of said single action is within a bid order entry region and wherein said trade order is a sell order if the position of the pointer at the time of said single action is within an ask order entry region.

3. A method of placing a trade order according to claim 2, wherein the trade order is for a pre-determined fixed quantity and for a price corresponding to the position of the pointer at the time of said single action.

4. A method of placing a trade order according to claim 2, wherein the trade order is for a quantity equal to a current net position of the user in the commodity and for a price corresponding to the position of the pointer at the time of said single action.

5. A method of placing a trade order according to claim 2, wherein the trade order is for a quantity equal to a pre-determined fixed offset plus the sum of all quantities in the market at prices better than or equal to a price corresponding to the position of the pointer at the time of said single action and for a price corresponding to said position.

6. A method of placing a trade order according to claim 2, wherein said offset is equal to a first pre-determined value if a single action of a first type is taken and said offset is equal to a second pre-determined value if a single action of a second type is taken.

7. A method of placing a trade order according to claim 2, further comprising canceling said trade order in response to a subsequent single action of the user input device.

8. A computer readable medium having program code recorded thereon, for execution on a computer having a graphical user interface and a user input device, to place a trade order for a commodity on an electronic exchange having an inside market with a highest bid price and a lowest ask price, comprising:

a first program code for setting a preset parameter for the trade order;

a second program code displaying market depth of a commodity, through a dynamic display of a plurality of bids and a plurality of asks in the market for the

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commodity, including the bid and ask quantities of the commodity, aligned with a static display of prices corresponding thereto, wherein the static display of prices does not move in response to a change in the inside market;

a third program code for displaying an order entry region comprising a plurality of areas for receiving commands from the user input device to send trade orders, aligned with the static display of prices, each area corresponding to a price of the static display of prices; and

a fourth program code for receiving a command as a result of a selection of a particular area in the order entry region by a single action of the user input device with a pointer of the user input device positioned over the particular area, to set a plurality of additional parameters for the trade order and send the trade order to the electronic exchange.

9. A computer readable medium having program code recorded thereon, for execution on a computer to place a trade order according to claim **8**, further comprising program code for establishing that said trade order is a buy order if the position of the pointer at the time of said single action is within a bid order entry region and that said trade order is a sell order if the position of the pointer at the time of said single action is within an ask order entry region.

10. A computer readable medium having program code recorded thereon, for execution on a computer to place a trade order according to claim **9**, further comprising program code for establishing that the trade order is for a pre-determined fixed quantity and for a price corresponding to the position of the pointer at the time of said single action.

11. A computer readable medium having program code recorded thereon, for execution on a computer to place a trade order according to claim **9**, further comprising program code for establishing that the trade order is for a quantity equal to a current net position of the user in the commodity and for a price corresponding to the position of the pointer at the time of said single action.

12. A computer readable medium having program code recorded thereon, for execution on a computer to place a trade order according to claim **9**, further comprising program code for establishing that the trade order is for a quantity equal to a pre-determined fixed offset plus the sum of all quantities in the market at prices better than or equal to a price corresponding to the position of the pointer at the time of said single action and for a price corresponding to said position.

13. A computer readable medium having program code recorded thereon, for execution on a computer to place a trade order according to claim **12**, further comprising program code for establishing that said offset is equal to a first pre-determined value if a single action of a first type is taken and said offset is equal to a second pre-determined value if a single action of a second type is taken.

14. A client system for placing a trade order for a commodity on an electronic exchange having an inside market with a highest bid price and a lowest ask price, the system comprising:

- a parameter setting component for setting a preset parameter for the trade order;
- a display device for displaying market depth of a commodity, through a dynamic display of a plurality of bids and a plurality of asks in the market for the commodity, including the bid and ask quantities of the commodity, aligned with a static display of prices corresponding thereto, wherein the static display of prices does not move when the inside market changes,

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and for displaying an order entry region aligned with the static display of prices, comprising a plurality of areas for receiving commands to send trade orders, each area corresponding to a price of the static display of prices;

a user input device for positioning a pointer thereof over an area in the order entry region; and
a trade order sending component for receiving a command as a result of a selection of the area in the order entry region by a single action of the user input device with a pointer of the user input device positioned over the area, to set a plurality of additional parameters for the trade order and send the trade order to the electronic exchange.

15. A client system for placing a trade order for a commodity according to claim **14**, wherein said trade order sending component establishes that said trade order is a buy order if the position of the pointer at the time of said single action is within a bid order entry region and that said trade order is a sell order if the position of the pointer at the time of said single action is within an ask order entry region.

16. A client system for placing a trade order for a commodity according to claim **15**, wherein said trade order sending component establishes that the trade order is for a pre-determined fixed quantity and for a price corresponding to the position of the pointer at the time of said single action.

17. A client system for placing a trade order for a commodity according to claim **15**, wherein said trade order sending component establishes that the trade order is for a quantity equal to a current net position of the user in the commodity and for a price corresponding to the position of the pointer at the time of said single action.

18. A client system for placing a trade order for a commodity according to claim **15**, wherein said trade order sending component establishes that the trade order is for a quantity equal to a predetermined fixed offset plus the sum of all quantities in the market at prices better than or equal to a price corresponding to the position of the pointer at the time of said single action and for a price corresponding to said position.

19. A client system for placing a trade order for a commodity according to claim **18**, wherein said trade order sending component establishes that said offset is equal to a first pre-determined value if a single action of a first type is taken and said offset is equal to a second predetermined value if a single action of a second type is taken.

20. A method according to claim **1**, wherein said displaying the market depth of a commodity traded in a market further comprises displaying said bids and asks in a vertical orientation.

21. A method according to claim **1**, wherein said displaying the market depth of a commodity traded in a market further comprises displaying said bids and asks in a horizontal orientation.

22. A method according to claim **1**, wherein a plurality of said displayed bids and asks in the market include bid and ask quantities of the commodity.

23. A method according to claim **1**, wherein said displaying the market depth of a commodity traded in a market further comprises displaying said bids and asks in different colors.

24. A method according to claim **1**, further comprising re-centering said prices corresponding to the bids and asks about an inside market price upon receipt of a re-centering instruction.

25. A method according to claim **1**, further comprising dynamically displaying working orders in alignment with the prices corresponding thereto.

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26. A method of displaying according to claim 1, further comprising dynamically displaying entered orders in alignment with the prices corresponding thereto, wherein said entered orders indicate a quantity of said commodity for which a trader's orders have been filled at said corresponding prices.

27. A method according to claim 1, wherein said displaying the market depth of a commodity traded in a market further comprises displaying said statically displayed prices in at least one direction in numerical order.

28. A method according to claim 1, wherein said displaying the market depth of a commodity traded in a market further comprises displaying said statically displayed prices along a single line in numerical order.

29. A method of displaying according to claim 1, wherein said displaying the market depth of a commodity traded in a market further comprises dynamically displaying a last traded quantity for said commodity in alignment with the price corresponding thereto.

30. A computer readable medium according to claim 8, further comprising program code to ensure that said displayed bids, asks and prices are oriented vertically.

31. A computer readable medium according to claim 8, further comprising program code to ensure that said displayed bids, asks and prices are oriented horizontally.

32. A computer readable medium according to claim 8, further comprising program code to ensure that a plurality of bids and asks in the market include bid and ask quantities of the commodity.

33. A computer readable medium according to claim 8, further comprising program code to ensure that bids and asks are displayed in different colors.

34. A computer readable medium according to claim 8, further comprising program code to ensure that said displayed prices corresponding to the bids and asks are re-centered about an inside market price upon receipt of a re-centering instruction.

35. A computer readable medium according to claim 8, further comprising program code for dynamically displaying working orders in alignment with the prices corresponding thereto.

36. A computer readable medium according to claim 8, further comprising program code for dynamically displaying entered orders in alignment with the prices corresponding thereto, wherein said entered orders indicate a quantity of said commodity for which a trader's orders have been filled at said corresponding prices.

37. A computer readable medium according to claim 8, further comprising program code to ensure that said statically displayed prices are displayed in at least one direction in numerical order.

38. A computer readable medium according to claim 8, further comprising program code to ensure that said statically displayed prices are displayed along a single line in numerical order.

39. A computer readable medium according to claim 8, further comprising program code for dynamically displaying a last traded quantity for said commodity in alignment with the price corresponding thereto.

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40. A client system according to claim 14, wherein said displays are oriented vertically.

41. A client system according to claim 14, wherein said displays are oriented horizontally.

42. A client system according to claim 14, wherein said displays of the pluralities of bids and asks in the market include bid and ask quantities of the commodity.

43. A client system according to claim 14, wherein said displays are displayed in different colors.

44. A client system according to claim 14, wherein said display of prices corresponding to the bids and asks is re-centered about an inside market price upon re-centering instruction from a user.

45. A client system according to claim 14, further comprising a display of working orders displayed in alignment with the prices corresponding thereto.

46. A client system according to claim 14, wherein said display device displays entered orders in alignment with the prices corresponding thereto and wherein said entered orders indicate a quantity of said commodity for which a trader's orders have been filled at said corresponding prices.

47. A client system according to claim 14, wherein said static display of prices is displayed in at least one direction in numerical order.

48. A client system according to claim 14, wherein said static display of prices is displayed along a single line in numerical order.

49. A client system according to claim 14, wherein said display device displays a last traded quantity for said commodity in alignment with the price corresponding thereto.

50. The method of claim 2, wherein the bid order entry region overlaps with a bid display region and the ask order entry region overlaps with an ask display region.

51. A computer readable medium having program code recorded thereon, for execution on a computer to place a trade order according to claim 9, wherein the bid order entry region overlaps with a bid display region and the ask order entry region overlaps with an ask display region.

52. A client system for placing a trade order for a commodity according to claim 15, wherein the bid order entry region overlaps with a bid display region and the ask order entry region overlaps with an ask display region.

53. The method of claim 1 wherein the market depth is based on an exchange order book and wherein the static display of prices does not move in response to the addition of a price to the exchange order book, the additional price comprising a displayed price.

54. The method of claim 53 wherein the static display of prices does not move in response to the removal of a price from the exchange order book, the removed price comprising a displayed price.

55. The method of claim 1 wherein the market depth is based on an exchange order book and the static display of prices never moves in response to a price change in the exchange order book relating to a price which is displayed.

56. The method of claim 1 wherein the plurality of additional parameters comprises a price and type of order.

* * * * *

UNITED STATES PATENT AND TRADEMARK OFFICE
CERTIFICATE OF CORRECTION

PATENT NO. : 6,772,132 B1
DATED : August 3, 2004
INVENTOR(S) : Gary Allan Kemp II, Jens-Uwe Schluetter and Harris Brumfield

Page 1 of 1

It is certified that error appears in the above-identified patent and that said Letters Patent is hereby corrected as shown below:

Title page.

Item [56], **References Cited**, OTHER PUBLICATIONS, after the last entry, insert
-- Patsystems News Release, PATSYSTEMS LAUNCHES J TRADER,
November 06, 2001 --.

Column 9.

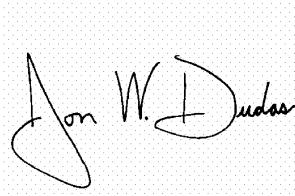
Line 65, delete "sell" and insert -- buy --.

Column 10.

Line 2, delete "buy" and insert -- sell --.

Signed and Sealed this

Second Day of August, 2005



JON W. DUDAS
Director of the United States Patent and Trademark Office



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(12) EX PARTE REEXAMINATION CERTIFICATE (6740th)
United States Patent
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(10) Number: **US 6,772,132 C1**
 (45) Certificate Issued: **Mar. 31, 2009**

(54) **CLICK BASED TRADING WITH INTUITIVE GRID DISPLAY OF MARKET DEPTH**

2003/0097325 A1 5/2003 Friesen et al.

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(73) Assignee: **Trading Technologies International, Inc.**, Evanston, IL (US)

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Reexamination Certificate for:

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Appl. No.:	09/590,692
Filed:	Jun. 9, 2000

Certificate of Correction issued Aug. 2, 2005.

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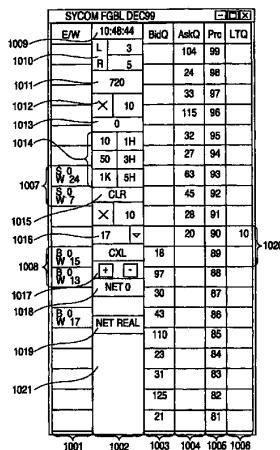
(57) **ABSTRACT**

A method and system for reducing the time it takes for a trader to place a trade when electronically trading on an exchange, thus increasing the likelihood that the trader will have orders filled at desirable prices and quantities. The "Mercury" display and trading method of the present invention ensure fast and accurate execution of trades by displaying market depth on a vertical or horizontal plane, which fluctuates logically up or down, left or right across the plane as the market prices fluctuates. This allows the trader to trade quickly and efficiently.

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**EX PARTE
REEXAMINATION CERTIFICATE
ISSUED UNDER 35 U.S.C. 307**

NO AMENDMENTS HAVE BEEN MADE TO
THE PATENT

2

AS A RESULT OF REEXAMINATION, IT HAS BEEN
DETERMINED THAT:

⁵ The patentability of claims **1–56** is confirmed.

* * * * *



US006766304B2

(12) **United States Patent**
Kemp, II et al.

(10) **Patent No.:** US 6,766,304 B2
(45) **Date of Patent:** Jul. 20, 2004

(54) **CLICK BASED TRADING WITH INTUITIVE GRID DISPLAY OF MARKET DEPTH**

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(List continued on next page.)

(73) Assignee: **Trading Technologies International, Inc.**, Chicago, IL (US)

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Primary Examiner—Richard Weisberger
(74) Attorney, Agent, or Firm—Foley & Lardner

(62) Division of application No. 09/590,692, filed on Jun. 9, 2000.
(60) Provisional application No. 60/186,322, filed on Mar. 2, 2000.
(51) Int. Cl.⁷ **G06F 17/60**
(52) U.S. Cl. **705/37; 705/36; 705/35**
(58) Field of Search **705/35, 36, 37; 345/814**

(57) ABSTRACT

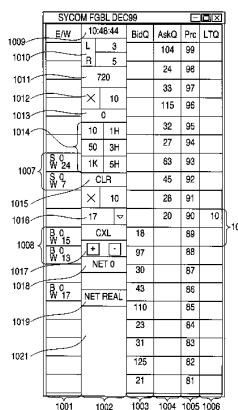
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A method and system for reducing the time it takes for a trader to place a trade when electronically trading on an exchange, thus increasing the likelihood that the trader will have orders filled at desirable prices and quantities. The “Mercury” display and trading method of the present invention ensure fast and accurate execution of trades by displaying market depth on a vertical or horizontal plane, which fluctuates logically up or down, left or right across the plane as the market prices fluctuates. This allows the trader to trade quickly and efficiently.

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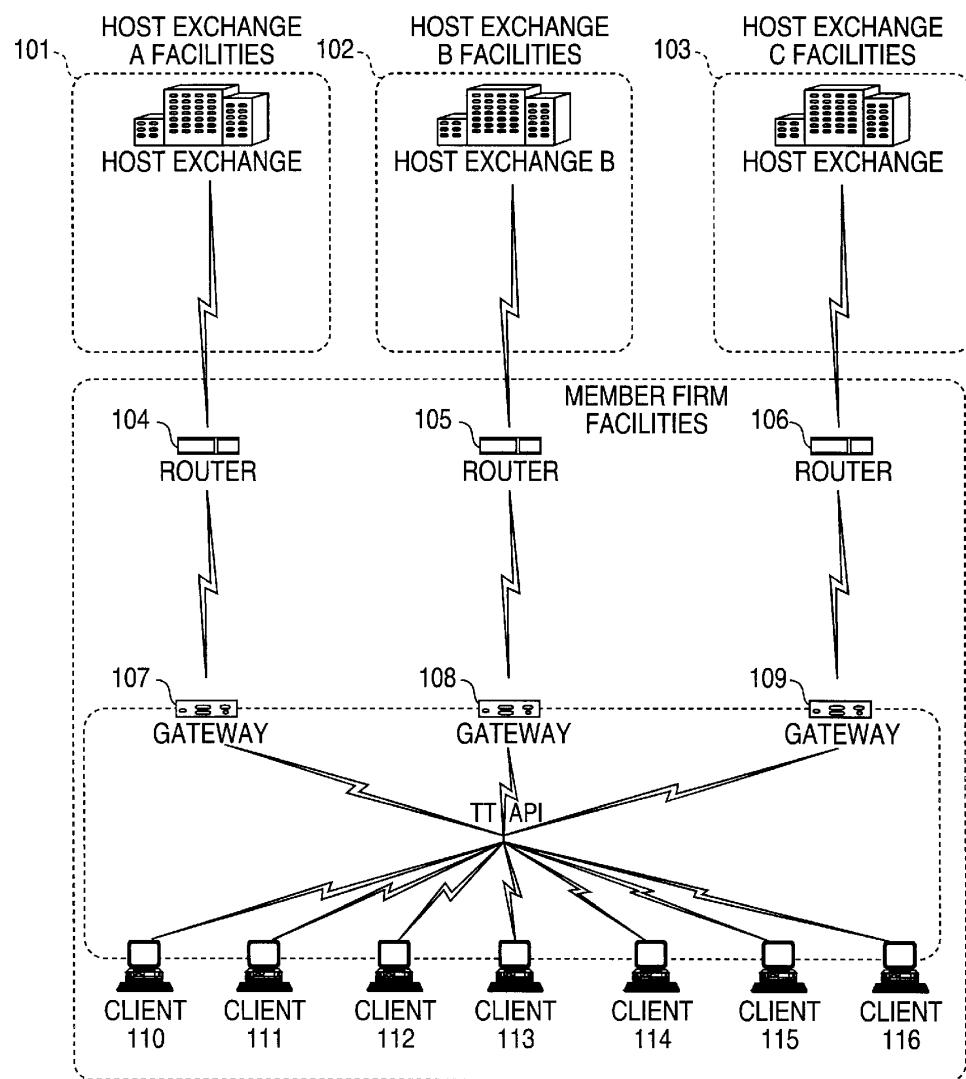
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FIG. 1

CONNECTION TO MULTIPLE EXCHANGES



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FIG. 2

201 202 203 204 205

Contract	Depth	BidQty	BidPrc	AskPrc	AskQty	LastPrc	LastQty	Total
CDHO	•	785	7626	7627	21	7627	489	8230
1		626	7625	7629	815			
2		500	7624	7630	600			
3		500	7623	7631	2456			
4		200	7622	7632	800			
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FIG. 3

SYCOM FGBL DEC99						
E/W	10:48:44		BidQ	AskQ	Prc	LTQ
1009	L	3		104	99	
1010	R	5		24	98	
1011	720			33	97	
1012	X	10		115	96	
1013	0			32	95	
1014	10	1H		27	94	
	50	3H		63	93	
1007	S 0	W 24	1K	5H		
	S 0	W 7	CLR		45	92
1015	X	10		28	91	
1016	17	▼		20	90	10
1008	CXL		18		89	
	+ -		97		88	
1017	NET 0		30		87	
1018	B 0 W 17		43		86	
1019	NET REAL		110		85	
1020			23		84	
1021			31		83	
			125		82	
			21		81	
			1001	1002	1003	1004
			1005	1006		

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FIG. 4

SYCOM FGBL DEC99

E/W	10:48:44		BidQ	AskQ	Prc	LTQ
	L	3		104	99	
	R	5		24	98	
	720			33	97	
	X	10		115	96	
	0			32	95	
	10	1H		27	94	
	50	3H		63	93	10
S 10 W 14	1K	5H	43		92	
	CLR		125		91	
	X	10	97		90	
	17	▼				
B 0 W 15	CXL		18		89	
B 0 W 13	[+]	-	97		88	
	NET 0		30		87	
B 0 W 17	NET REAL		43		86	
			110		85	
			23		84	
			31		83	
			125		82	
			21		81	

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FIG. 5

SYCOM FGBL DEC99

E/W	10:48:44		BidQ	AskQ	Prc	LTQ
	L	3		104	99	
	R	5		24	98	
	720			33	97	
	X	10		115	96	
	0			32	95	
	10	1H		27	94	
	50	3H		63	93	
S 0 W 24	1K	5H		45	92	
S 0 W 7	CLR			28	91	
	X	10		20	90	10
	17	▼		18		89
B 0 W 15	CXL			97		88
B 0 W 13	[+]	-		30		87
	NET 0			43		86
B 0 W 17	NET REAL			110		85
				23		84
				31		83
				125		82
				21		81

1208

1201

1202

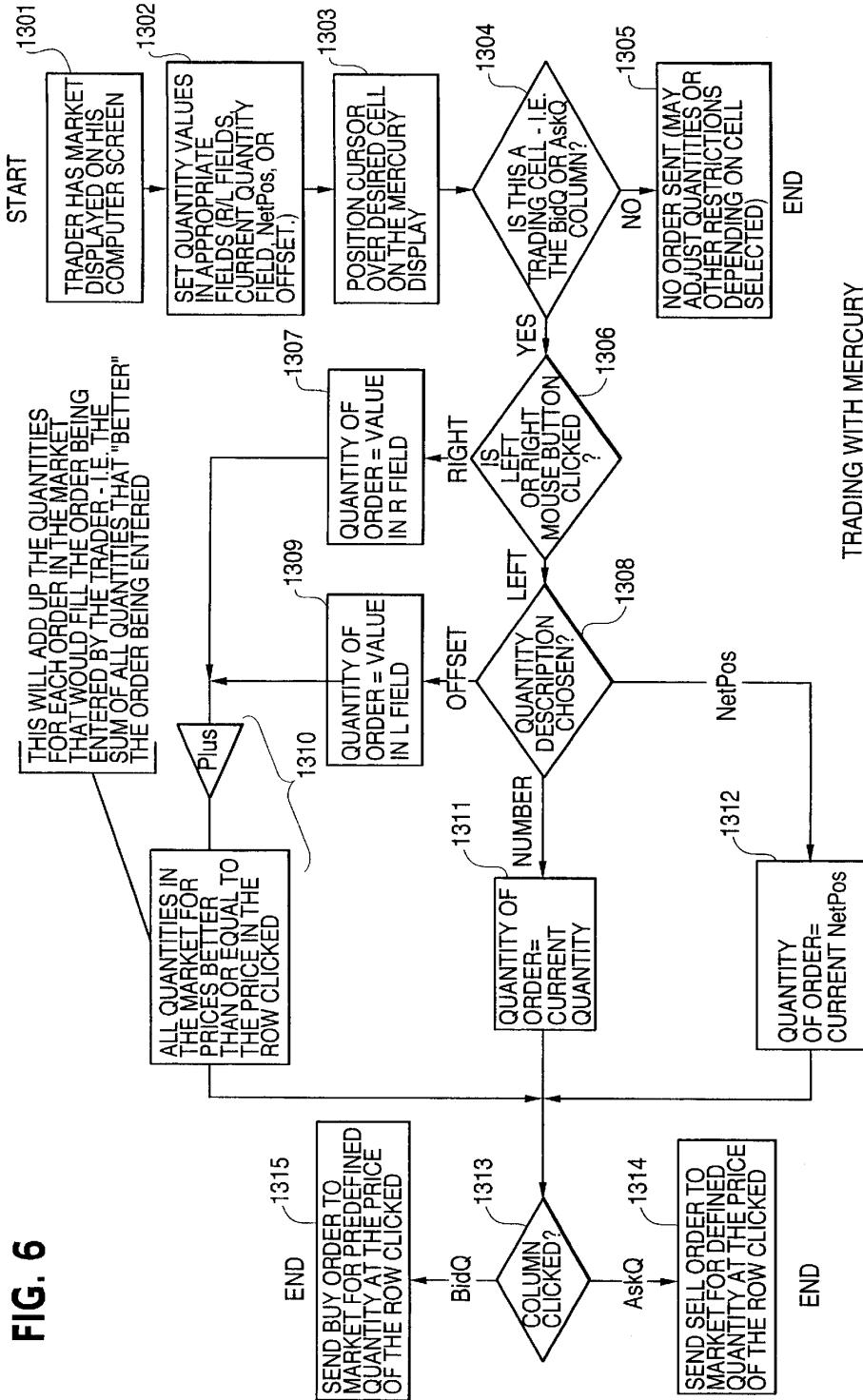
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1**CLICK BASED TRADING WITH INTUITIVE GRID DISPLAY OF MARKET DEPTH**

This application is a divisional application of Ser. No. 09/590,692 filed Jun. 09, 2000 which claims benefit of 5 60/186,322, filed Mar. 2, 2000.

PRIORITY

The present application claims priority to a U.S. Provisional Patent Application entitled "Market Depth Display Click Based Trading and Mercury Display" filed Mar. 2, 2000, the contents of which are incorporated herein by reference.

FIELD OF INVENTION

The present invention is directed to the electronic trading of commodities. Specifically, the invention provides a trader with a versatile and efficient tool for executing trades. It facilitates the display of and the rapid placement of trade orders within the market trading depth of a commodity, where a commodity includes anything that can be traded with quantities and/or prices.

BACKGROUND OF THE INVENTION

At least 60 exchanges throughout the world utilize electronic trading in varying degrees to trade stocks, bonds, futures, options and other products. These electronic exchanges are based on three components: mainframe computers (host), communications servers, and the exchange participants' computers (client). The host forms the electronic heart of the fully computerized electronic trading system. The system's operations cover order-matching, maintaining order books and positions, price information, and managing and updating the database for the online trading day as well as nightly batch runs. The host is also equipped with external interfaces that maintain uninterrupted online contact to quote vendors and other price information systems.

Traders can link to the host through three types of structures: high speed data lines, high speed communications servers and the Internet. High speed data lines establish direct connections between the client and the host. Another connection can be established by configuring high speed networks or communications servers at strategic access points worldwide in locations where traders physically are located. Data is transmitted in both directions between traders and exchanges via dedicated high speed communication lines. Most exchange participants install two lines between the exchange and the client site or between the communication server and the client site as a safety measure against potential failures. An exchange's internal computer system is also often installed with backups as a redundant measure to secure system availability. The third connection utilizes the Internet. Here, the exchange and the traders communicate back and forth through high speed data lines, which are connected to the Internet. This allows traders to be located anywhere they can establish a connection to the Internet.

Irrespective of the way in which a connection is established, the exchange participants' computers allow traders to participate in the market. They use software that creates specialized interactive trading screens on the traders' desktops. The trading screens enable traders to enter and execute orders, obtain market quotes, and monitor positions. The range and quality of features available to traders on their

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screens varies according to the specific software application being run. The installation of open interfaces in the development of an exchange's electronic strategy means users can choose, depending on their trading style and internal requirements, the means by which they will access the exchange.

The world's stock, bond, futures and options exchanges have volatile products with prices that move rapidly. To profit in these markets, traders must be able to react quickly. 10 A skilled trader with the quickest software, the fastest communications, and the most sophisticated analytics can significantly improve his own or his firm's bottom line. The slightest speed advantage can generate significant returns in a fast moving market. In today's securities markets, a trader lacking a technologically advanced interface is at 15 severe competitive disadvantage.

Irrespective of what interface a trader uses to enter orders in the market, each market supplies and requires the same information to and from every trader. The bids and asks in the market make up the market data and everyone logged on 20 to trade can receive this information if the exchange provides it. Similarly, every exchange requires that certain information be included in each order. For example, traders must supply information like the name of the commodity, quantity, restrictions, price and multiple other variables. 25 Without all of this information, the market will not accept the order. This input and output of information the same for every trader.

With these variables being constant, a competitive speed advantage must come from other aspects of the trading 30 cycle. When analyzing the time it takes to place a trade order for a given commodity, various steps contribute in different amounts to the total time required. Approximately 8% of the total time it takes to enter an order elapses between the moment the host generates the price for the commodity and 35 the moment the client receives the price. The time it takes for the client application to display the price to the trader amounts to approximately 4%. The time it takes for a trade order to be transmitted to the host amounts to approximately 8%. The remainder of the total time it takes to place an order, 40 approximately 80%, is attributable to the time required for the trader to read the prices displayed and to enter a trade order. The present invention provides a significant advantage during the slowest portion of the trading cycle—while the trader manually enters his order. Traders recognize that the value of time savings in this portion may amount to millions of dollars annually.

In existing systems, multiple elements of an order must be entered prior to an order being sent to market, which is time consuming for the trader. Such elements include the commodity symbol, the desired price, the quantity and whether 50 a buy or a sell order is desired. The more time a trader takes entering an order, the more likely the price on which he wanted to bid or offer will change or not be available in the market. The market is fluid as many traders are sending 55 orders to the market simultaneously. In fact, successful markets strive to have such a high volume of trading that any trader who wishes to enter an order will find a match and have the order filled quickly, if not immediately. In such liquid markets, the prices of the commodities fluctuate rapidly. On a trading screen, this results in rapid changes in the price and quantity fields within the market grid. If a trader intends to enter an order at a particular price, but misses the price because the market prices moved before he could enter the order, he may lose hundreds, thousands, even 60 millions of dollars. The faster a trader can trade, the less likely it will be that he will miss his price and the more likely he will make money.

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3**SUMMARY OF THE INVENTION**

The inventors have developed the present invention which overcomes the drawbacks of the existing trading systems and dramatically reduces the time it takes for a trader to place a trade when electronically trading on an exchange. This, in turn, increases the likelihood that the trader will have orders filled at desirable prices and quantities.

The "Mercury" display and trading method of the present invention ensure fast and accurate execution of trades by displaying market depth on a vertical or horizontal plane, which fluctuates logically up or down, left or right across the plane as the market prices fluctuate. This allows the trader to trade quickly and efficiently.

Specifically, the present invention is directed to a graphical user interface for displaying the market depth of a commodity traded in a market, including a dynamic display for a plurality of bids and for a plurality of asks in the market for the commodity and a static display of prices corresponding to the plurality of bids and asks. In this embodiment the pluralities of bids and asks are dynamically displayed in alignment with the prices corresponding thereto. Also described herein is a method and system for placing trade orders using such displays.

These embodiments, and others described in greater detail herein, provide the trader with improved efficiency and versatility in placing, and thus executing, trade orders for commodities in an electronic exchange. Other features and advantages of the present invention will become apparent to those skilled in the art from the following detailed description. It should be understood, however, that the detailed description and specific examples, while indicating preferred embodiments of the present invention, are given by way of illustration and not limitation. Many changes and modifications within the scope of the present invention may be made without departing from the spirit thereof, and the invention includes all such modifications.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 illustrates the network connections between multiple exchanges and client sites;

FIG. 2 illustrates screen display showing the inside market and the market depth of a given commodity being traded;

FIG. 3 illustrates the Mercury display of the present invention;

FIG. 4 illustrates the Mercury display at a later time showing the movement of values when compared to FIG. 3;

FIG. 5 illustrates a Mercury display with parameters set in order to exemplify the Mercury trading method; and

FIG. 6 is a flowchart illustrating the process for Mercury display and trading.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

As described with reference to the accompanying figures, the present invention provides a display and trading method to ensure fast and accurate execution of trades by displaying market depth on a vertical or horizontal plane, which fluctuates logically up or down, left or right across the plane as the market prices fluctuate. This allows the trader to place trade orders quickly and efficiently. A commodity's market depth is the current bid and ask prices and quantities in the market. The display and trading method of the invention increase the likelihood that the trader will be able to execute orders at desirable prices and quantities.

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In the preferred embodiment, the present invention is implemented on a computer or electronic terminal. The computer is able to communicate either directly or indirectly (using intermediate devices) with the exchange to receive and transmit market, commodity, and trading order information. It is able to interact with the trader and to generate contents and characteristics of a trade order to be sent to the exchange. It is envisioned that the system of the present invention can be implemented on any existing or future terminal or device with the processing capability to perform the functions described herein. The scope of the present invention is not limited by the type of terminal or device used. Further, the specification refers to a single click of a mouse as a means for user input and interaction with the terminal display as an example of a single action of the user. While this describes a preferred mode of interaction, the scope of the present invention is not limited to the use of a mouse as the input device or to the click of a mouse button as the user's single action. Rather, any action by a user within a short period of time, whether comprising one or more clicks of a mouse button or other input device, is considered a single action of the user for the purposes of the present invention.

The system can be configured to allow for trading in a single or in multiple exchanges simultaneously. Connection of the system of the present invention with multiple exchanges is illustrated in FIG. 1. This figure shows multiple host exchanges 101-103 connected through routers 104-106 to gateways 107-109. Multiple client terminals 110-116 for use as trading stations can then trade in the multiple exchanges through their connection to the gateways 107-109. When the system is configured to receive data from multiple exchanges, then the preferred implementation is to translate the data from various exchanges into a simple format. This "translation" function is described below with reference to FIG. 1. An applications program interface ("TT API" as depicted in the figure) translates the incoming data formats from the different exchanges to a simple preferred data format. This translation function may be disposed anywhere in the network, for example, at the gateway server, at the individual workstations or at both. In addition, the storage at gateway servers and at the client workstations, and/or other external storage cache historical data such as order books which list the client's active orders in the market; that is, those orders that have neither been filled nor cancelled. Information from different exchanges can be displayed at one or in multiple windows at the client workstation. Accordingly, while reference is made through the remainder of the specification to a single exchange to which a trading terminal is connected, the scope of the invention includes the ability to trade, in accordance with the trading methods described herein, in multiple exchanges using a single trading terminal.

The preferred embodiments of the present invention include the display of "Market Depth" and allow trader to view the market depth of a commodity and to execute trades within the market depth with a single click of a computer mouse button. Market Depth represents the order book with the current bid and ask prices and quantities in the market. In other words, Market Depth is each bid and ask that was entered into the market, subject to the limits noted below, in addition to the inside market. For a commodity being traded, the "inside market" is the highest bid price and the lowest ask price.

The exchange sends the price, order and fill information to each trader on the exchange. The present invention processes this information and maps it through simple

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algorithms and mapping tables to positions in a theoretical grid program or any other comparable mapping technique for mapping data to a screen. The physical mapping of such information to a screen grid can be done by any technique known to those skilled in the art. The present invention is not limited by the method used to map the data to the screen display.

How far into the market depth the present invention can display depends on how much of the market depth the exchange provides. Some exchanges supply an infinite market depth, while others provide no market depth or only a few orders away from the inside market. The user of the present invention can also chose how far into the market depth to display on his screen. FIG. 2 illustrates a screen display of an invention described in a commonly owned co-pending application entitled "Click Based Trading with Market Depth Display" Ser. No. 09/589,751, filed on Jun. 9, 2000, the contents of which are incorporated herein by reference. This display shows the inside market and the market depth of a given commodity being traded. Row 1 represents the "inside market" for the commodity being traded which is the best (highest) bid price and quantity and the best (lowest) ask price and quantity. Rows 2-5 represent the "market depth" for the commodity being traded. In the preferred embodiment of the present invention, the display of market depth (rows 2-5) lists the available next-best bids, in column 203, and asks, in column 204. The working bid and ask quantity for each price level is also displayed in columns 202 and 205 respectively (inside market-row 1). Prices and quantities for the inside market and market depth update dynamically on a real time basis as such information is relayed from the market.

In the screen display shown in FIG. 2, the commodity (contract) being traded is represented in row 1 by the character string "CDHO". The Depth column 208 will inform the trader of a status by displaying different colors. Yellow indicates that the program application is waiting for data. Red indicates that the Market Depth has failed to

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receive the data from the server and has "timed out." Green indicates that the data has just been updated. The other column headings in this and all of the other figures, are defined as follows. BidQty (Bid Quantity): the quantity for each working bid, BidPrc (Bid Price): the price for each working bid, AskPrc (Ask Price): the price for each working ask, AskQty (Ask Quantity): the quantity for each working ask, LastPrc (Last Price): the price for the last bid and ask that were matched in the market and LastQty (Last Quantity): the quantity added at the last price. Total represents the total quantity traded of the given commodity.

The configuration of the screen display itself informs the user in a more convenient and efficient manner than existing systems. Traders gain a significant advantage by seeing the market depth because they can see trends in the orders in the market. The market depth display shows the trader the interest the market has in a given commodity at different price levels. If a large amount of bids or asks are in the market near the trader's position, he may feel he should sell or buy before the inside market reaches the morass of orders. A lack of orders above or below the inside market might prompt a trader to enter orders near the inside market. Without seeing the market depth, no such strategies could be utilized. Having the dynamic market depth, including the bid and ask quantities and prices of a traded commodity aligned with and displayed below the current inside market of the commodity conveys the information to the user in a more intuitive and easily understandable manner. Trends in the trading of, the commodity and other relevant characteristics are more easily identifiable by the user through the use of the present invention.

Various abbreviations are used in the screen displays, and specifically, in the column headings of the screen displays reproduced herein. Some abbreviations have been discussed above. A list of common abbreviations and their meanings is provided in Table 1.

TABLE I

Abbreviations.

COLUMN	DESCRIPTION	COLUMN	DESCRIPTION
Month	Expiration Month/Year	TheoBid	Theoretical Bid Price
Bid Mbr(1)	Bid Member ID	TheoAsk	Theoretical Ask Price
WrkBuys(2)	Working Buys for entire Group ID	Qact	Quote Action (Sends individual quotes)
BidQty	Bid Quantity	BQQ	Test Bid Quote Quantity
ThshBld(6)	Threshold Bid Price	BQP	Test Bid Quote Price
BidPrc	Bid Price	Mkt BQQ	Market Bid Quote Quantity
Bid Qty Accurn	Accumulated Bid Quantity	Mkt BQP	Market Bid Quote Price
BidPrc Avg	Bid Price Average	Quote	Checkbox activates/deactivates contract for quoting
AskPrc Avg	Ask Price Average	Mkt AQQ	Market Ask Quote Quantity
AskQty Accurn	Accumulated Ask Quantity	Mkt AQP	Market Ask Quote Price
AskPrc	Ask Price	AQP	Ask Quote Price
ThshAsk(6)	Threshold Ask Price	AQO	Ask Quote Quantity
AskQty	Ask Quantity	Imp BidQty(5)	Implied Bid Quantity
WrkSells(2)	Working Sells for entire Group ID	Imp BidPrc(5)	Implied Bid Price
Ask Mbr(1)	Ask Member ID	Imp AskQty(5)	Implied Ask Quantity
NetPos	Net Position	Imp AskPrc(5)	Implied Ask Price
FFNetPos	Fast Fill Net Position	Gamma(3)	Change in Delta given 1 pt change in underlying
LastPrc	Last Price	Delta (3)	Change in price given 1 pt change in underlying
LastQty	Last Quantity	Vola (3)	Percent volatility
Total	Total Traded Quantity	Vega (3)	Price change given 1% change in Vola
High	High Price	Rhop (3)	Price change given 1% change in interest rate

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TABLE I-continued

<u>Abbreviations.</u>			
COLUMN	DESCRIPTION	COLUMN	DESCRIPTION
Low	Low Price	Theta(3)	Price change for every day that elapses
Open	Opening Price	Click Trd	Activate/deactivate click trading by contract
Close	Closing Price	S (Status)	Auction, Closed, FastMkt, Not Tradable, Pre-trading, Tradable, S = post-trading
Chng	Last Price-Last Close	Expiry	Expiration Month/Year
TheoPrc	Theoretical Price		

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As described herein, the display and trading method of the present invention provide the user with certain advantages over systems in which a display of market depth, as shown in FIG. 2, is used. The Mercury display and trading method of the present invention ensure fast and accurate execution of trades by displaying market depth on a vertical or horizontal plane, which fluctuates logically up or down, left or right across the plane as the market prices fluctuates. This allows the trader to trade quickly and efficiently. An example of such a Mercury display is illustrated in the screen display of FIG. 3.

The display of market depth and the manner in which traders trade within the market depth can be effected in different manners, which many traders will find materially better, faster and more accurate. In addition, some traders may find the display of market depth to be difficult to follow. In the display shown in FIG. 2, the market depth is displayed vertically so that both Bid and Ask prices descend the grid. The Bid prices descend the market grid as the prices decrease. Ask prices also descend the market grid as these prices actually increase. This combination may be considered counterintuitive and difficult to follow by some traders.

The Mercury display overcomes this problem in an innovative and logical manner. Mercury also provides an order entry system, market grid, fill window and summary of market orders in one simple window. Such a condensed display materially simplifies the trading system by entering and tracking trades in an extremely efficient manner. Mercury displays market depth in a logical, vertical fashion or horizontally or at some other convenient angle or configuration. A vertical field is shown in the figures and described for convenience, but the field could be horizontal or at an angle. In turn, Mercury further increases the speed of trading and the likelihood of entering orders at desired prices with desired quantities. In the preferred embodiment of the invention, the Mercury display is a static vertical column of prices with the bid and ask quantities displayed in vertical columns to the side of the price column and aligned with the corresponding bid and ask prices. An example of this display is shown in FIG. 3.

Bid quantities are in the column 1003 labeled BidQ and ask quantities are in column 1004 labeled AskQ. The representative ticks from prices for the given commodity are shown in column 1005. The column, does not list the whole prices (e.g. 95.89), but rather, just the last two digits (e.g. .89). In the example shown, the inside market, cells 1020, is 18 (best bid quantity) at 89 (best bid price) and 20 (best ask quantity) at 90 (best ask price). In the preferred embodiment of the invention, these three columns are shown in different colors so that the trader can quickly distinguish between them.

The values in the price column are static; that is, they do not normally change positions unless a re-centering command is received (discussed in detail later). The values in the

Bid and Ask columns however, are dynamic; that is, they move up and down (in the vertical example) to reflect the market depth for the given commodity. The LTQ column 1006 shows the last traded quantity of the commodity. The relative position of the quantity value with respect to the Price values reflects the price at which that quantity was traded. Column 1001 labeled E/W (entered/working) displays the current status of the trader's orders. The status of each order is displayed in the price row where it was entered. For example, in cells 1007, the number next to S indicates the number of the trader's ordered lots that have been sold at the price in the specific row. The number next to W indicates the number of the trader's ordered lots that are in the market, but have not been filled—i.e. the system is working on filling the order. Blanks in this column indicate that no orders are entered or working at that price. In cells 1008, the number next to B indicates the number of the trader's ordered lots that have been bought at the price in the specific row. The number next to W indicates the number of the trader's ordered lots that are in the market, but have not been filled—i.e. the system is working on filling the order.

Various parameters are set and information is provided in column 1002. For example, “10:48:44” in cell 1009 shows the actual time of day. The L and R fields in cell 1010 indicate a quantity value, which may be added to the order quantity entered. This process is explained below with respect to trading under Mercury. Below the L and R fields, in cell 1011, a number appears which represents the current market volume. This is the number of lots that have been traded for the chosen contract. Cell 1012, “X 10”, displays the Net Quantity, the current position of the trader on the chosen contract. The number “10” represents the trader's buys minus sells. Cell 1013 is the “Current Quantity”; this field represents the quantity for the next order that the trader will send to market. This can be adjusted with right and left clicks (up and down) or by clicking the buttons which appear below the Current Quantity in cells 1014. These buttons increase the current quantity by the indicated amount; for example, “10” will increase it by 10; “1H” will increase it by 100; “1K” will increase it by 1000. Cell 1015 is the Clear button; clicking this button will clear the Current Quantity field. Cell 1016 is the Quantity Description; this is a pull down menu allowing the trader to chose from three Quantity Descriptions. The pull down menu is displayed when the arrow button in the window is clicked. The window includes NetPos, Offset and a field allowing the trader to enter numbers.. Placing a number in this field will set a default buy or sell quantity. Choosing “Offset” in this field will enable the L/R buttons of cell 1010. Choosing “NetPos” in this field will set the current Net Quantity (trader's net position) as the trader's quantity for his next trade. Cell 1017 are +/- buttons; these buttons will alter the size of the screen—either larger (+) or smaller (-). Cell 1018 is used to invoke Net 0; clicking this button will reset the Net Quantity

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(cell **1011**) to zero. Cell **1019** is used to invoke Net Real; clicking this button will reset the Net Quantity (cell **10 11**) to its actual position.

The inside market and market depth ascend and descend as prices in the market increase and decrease. For example, FIG. 4 shows a screen displaying the same market as that of FIG. 3 but at a later interval where the inside market, cells **1101**, has risen three ticks. Here, the inside market for the commodity is 43 (best bid quantity) at 92 (best bid price) and 63 (best ask quantity) at 93 (best ask price). In comparing FIGS. 3 and 4, it can be seen that the price column remained static, but the corresponding bids and asks rose up the price column. Market Depth similarly ascends, and descends the price column, leaving a vertical history of the market.

As the market ascends or descends the price column, the inside market, might go above or below the price column displayed on a trader's screen. Usually a trader will want to be able to see the inside market to assess future trades. The system of the present invention addresses this problem with a one click centering feature. With a single click at any point within the gray area, **1021**, below the "Net Real" button, the system will re-center the inside market on the trader's screen. Also, when using a three-button mouse, a click of the middle mouse button, irrespective of the location of the mouse pointer, will re-center the inside market on the trader's screen.

The same information and features can be displayed and enabled in a horizontal fashion. Just as -the market ascends and descends the vertical Mercury display shown in FIGS. 3 and 4, the market will move left and right in the horizontal Mercury display. The same data and the same information gleaned from the dynamical display of the data is provided. It is envisioned that other orientations can be used to dynamically display the data and such orientations are intended to come within the scope of the present invention.

Next, trading commodities, and specifically, the placement of trade orders using the Mercury display is described. Using the Mercury display and trading method, a trader would first designate the desired commodity and, if applicable, the default quantities. Then he can trade with single clicks of the right or left mouse button. The following equations are used by the system to generate trade orders and to determine the quantity and price to be associated with the trade order. The following abbreviations are used in these formulas: P=Price value of row clicked, R=Value in R field, L=Value in L field, Q=Current Quantity, Q_a =Total of all quantities in AskQ column at an equal or better price than P, Q_b =Total of all quantities in BidQ column at an equal or better price than P, N=Current Net Position, Bo=Buy order sent to market and So=Sell order—sent to market.

Apy order entered using right mouse button

$$Bo=(Q_a+R)P \quad (\text{Eq. 1})$$

If BidQ field clicked.

$$So=(Q_b+R)P \quad (\text{Eq. 2})$$

If AskQ field clicked.

Orders entered using the left mouse button

If "Offset" mode chosen in Quantity Description field then:

$$Bo=(Q_a+L)P \quad (\text{Eq. 3})$$

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If BidQ field clicked.

$$So=(Q_b+L)P \quad (\text{Eq. 4})$$

If AskQ field clicked.

If "number" mode chosen in Quantity Description field then:

$$Bo=QP \quad (\text{Eq. 5})$$

$$So=QP \quad (\text{Eq. 6})$$

If "NetPos" mode chosen in Quantity Description field then:

$$Bo=NP \quad (\text{Eq. 7})$$

$$So=NP \quad (\text{Eq. 8})$$

Orders can also be sent to market for quantities that vary according to the quantities available in the market; quantities preset by the trader; and which mouse button the trader clicks. Using this feature, a trader can buy or sell all of the bids or asks in the market at or better than a chosen price with one click. The trader could also add or subtract a preset quantity from the quantities outstanding in the market. If the trader clicks in a trading cell—i.e. in the BidQ or AskQ column, he will enter an order in the market. The parameters of the order depend on which mouse button he clicks and what preset values he set.

Using the screen display and values from FIG. 5, the placement of trade orders using the Mercury display and trading method is now described using examples. A left click on the 18 in the BidQ column **1201** will send an order to market to buy 17 lots (quantity #chosen on the Quantity Description pull down menu cell **1204**) of the commodity at a price of 89 (the corresponding price in the Prc column **1203**). Similarly, a left click on the 20 in the AskQ column **1202** will send an order to market to sell 17 lots at a price of 90.

Using the right mouse button, an order would be sent to market at the price that corresponds to the row clicked for the total quantity of orders in the market that equal or better the price in that row plus the quantity in the R field **1205**. Thus, a right click in the AskQ column **1202** in the 87 price row will send a sell order to market at a price of 87 and a quantity of 150. 150 is the sum of all the quantities 30, 97, 18 and 5. 30, 97 and 18 are all of the quantities in the market that would meet or better the trader's sell order price of 87. These quantities are displayed in the BidQ column **1201** because this column represents the orders outstanding in the market to purchase the commodity at each corresponding price. The quantity 5 is the quantity pre-set in the R field **1205**.

Similarly, a right click in the BidQ column **1201** at the same price level of 87 would send a buy limit order to market for a quantity of 5 at a price of 87. The quantity is determined in the game manner as above. In this example, though, there are no orders in the market that equal or better the chosen price—there are no quantities in the AskQ column **1202** that equal or better this price. Therefore, the sum of the equal or better quantities is zero ("0"). The total order entered by the trader will be the value in the R field, which is 5.

An order entered with the left mouse button and the "Offset" option chosen in the quantity description field **1204**

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will be calculated in the same way as above, but the quantity in the L field **1206** will be added instead of the quantity in the R field **1205**. Thus, a left click in the BidQ column **1201** in the 92 price row will send a buy order to market at a price of 92 and a quantity of 96. 96 is the sum of all the quantities 45, 28, 20 and 3. 45, 28 and 20 are all quantities in the market that would meet or better the trader's buy order price of 92. These quantities are displayed in the AskQ column **1202** because this column represents the orders outstanding in the market to sell the commodity at each corresponding price. The quantity 3 is the quantity pre-set in the L field **1206**.

The values in the L or R fields may be negative numbers. This would effectively decrease the total quantity sent to market. In other words, in the example of a right click in the AskQ column **1202** in the 87 price row, if the R field was -5, the total quantity sent to market would be 140 (30+97+18+(-5)).

If a trader chose the "NetPos" option in the quantity description field **1204**, a right click would still work as explained above. A left click would enter an order with a price corresponding to the price row clicked and a quantity equal to the current Net position of the trader. The Net position of the trader is the trader's current position on the chosen contract. In other words, if the trader has bought 10 more contracts than he has sold, this value would be 10. NetPos would not affect the quantity of an order sent with a right click.

If the trader chose a number value in the quantity description, a left click would send an order to market for the current quantity chosen by the trader. The default value of the current quantity will be the number entered in the quantity description field, but it could be changed by adjusting the figure in the current quantity field **1204**.

This embodiment of the invention also allows a trader to delete all of his working trades with a single click of either the right or left mouse button anywhere in the last traded quantity (LTQ) column **1207**. This allows a trader to exit the market immediately. Traders will use this feature when they are losing money and want to stop the losses from piling up. Traders may also use this feature to quickly exit the market upon making a desired profit. The invention also allows a trader to delete all of his orders from the market at a particular price level. A click with either mouse button in the Entered/Working (E/W) column **1208** will delete all working orders in the cell that was clicked. Thus, if a trader believes that previously sent orders at a particular price that have not been filled would be poor trades, he can delete these orders with a single click.

The process for placing trade orders using the Mercury display and trading method of the present invention as described above is shown in the flowchart of FIG. 6. First, in step **1301**, the trader has the Mercury display on the trading terminal screen showing the market for a given commodity. In step **1302**, the parameters are set in the appropriate fields, such as the L and R fields and the Current Quantity, NetPos or Offset fields from the pull down menu. In step **1303**, the mouse pointer is positioned and clicked over a cell in the Mercury display by the trader. In step **1304**, the system determines whether the cell clicked is a tradable cell (i.e. in the AskQ column or BidQ column). If not, then in step **1305**, no trade order is created or sent and, rather, other quantities are adjusted or functions are performed based upon the cell selected. Otherwise, in step **1306**, the system determines whether it was the left or the right button of the mouse that was clicked. If it was the right, then in step **1307**, the system will use the quantity in the R field when it

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determines the total quantity of the order in step **1310**. If the left button was clicked, then in step **1308**, the system determines which quantity description was chosen: Offset, NetPos or an actual number.

If Offset was chosen, then the system, in step **1309**, will use the quantity in the L field when it determines the total quantity of the order in step **1310**. If NetPos was chosen, then the system, in step **1312**, will determine that the total quantity for the trade order will be current NetPos value, i.e. the net position of the trader in the given commodity. If an actual number was used as the quantity description, then, in step **1311**, the system will determine that the total quantity for the trade order will be the current quantity entered. In step **1310**, the system will determine that the total quantity for the trade order will be the value of the R field (if step **1307** was taken) or the value of the L field (if step **1309** was taken) plus all quantities in the market for prices better than or equal to the price in the row clicked. This will add up the quantities for each order in the market that will fill the order being entered by the trader (plus the L or R value).

After either steps **1310**, **1311** or **1312**, the system, in step **1313**, determines which column was clicked, BidQ or AskQ. If AskQ was clicked, then, in step **1314**, the system sends a sell limit order to the market at the price corresponding to the row for the total quantity as already determined. If BidQ was clicked, then, in step **1315**, the system sends a buy limit order to the market at the price corresponding to the row for the total quantity as already determined.

It should be understood that the above description of the invention and specific examples, while indicating preferred embodiments of the present invention, are given by way of illustration and not limitation. Many changes and modifications within the scope of the present invention may be made without departing from the spirit thereof, and the present invention includes all such changes and modifications.

We claim:

1. A method for displaying market information relating to and facilitating trading of a commodity being traded in an electronic exchange having an inside market with a highest bid price and a lowest ask price on a graphical user interface, the method comprising:

dynamically displaying a first indicator in one of a plurality of locations in a bid display region, each location in the bid display region corresponding to a price level along a common static price axis, the first indicator representing quantity associated with at least one order to buy the commodity at the highest bid price currently available in the market;

dynamically displaying a second indicator in one of a plurality of locations in an ask display region, each location in the ask display region corresponding to a price level along the common static price axis, the second indicator representing quantity associated with at least one order to sell the commodity at the lowest ask price currently available in the market;

displaying the bid and ask display regions in relation to fixed price levels positioned along the common static price axis such that when the inside market changes, the price levels along the common static price axis do not move and at least one of the first and second indicators moves in the bid or ask display regions relative to the common static price axis;

displaying an order entry region comprising a plurality of locations for receiving commands to send trade orders, each location corresponding to a price level along the common static price axis; and

in response to a selection of a particular location of the order entry region by a single action of a user input

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device, setting a plurality of parameters for a trade order relating to the commodity and sending the trade order to the electronic exchange.

2. The method of claim 1 wherein the bid and ask display regions and the order entry region comprise columns with a plurality of cells that are displayed as a grid such that the cells of each column are aligned.

3. The method of claim 1 wherein the bid and ask display regions and the order entry region are oriented vertically.

4. The method of claim 1 wherein the bid and ask display regions and the order entry region are oriented horizontally.

5. The method of claim 1 wherein one of the plurality of locations of bid display region comprises a blank region in which there is no first indicator displayed.

6. The method of claim 1 wherein one of the plurality of locations of the ask display region comprises a blank region in which there is no first indicator displayed.

7. The method of claim 1 comprising the step of displaying at least a portion of the common static price axis in a price display region.

8. The method of claim 7 wherein the bid display region, the ask display region, the order entry region and the price display region comprise columns with a plurality of cells that are displayed as a grid such that the cells of each column are aligned.

9. The method of claim 7 wherein the bid display region, the ask display region, the order entry region and the price display region are oriented vertically.

10. The method of claim 7 wherein the bid display region, the ask display region, the order entry region and the price display region are oriented horizontally.

11. The method of claim 1 further comprising the steps of: dynamically displaying a third indicator at one of the plurality of locations in the bid display region, the third indicator representing quantity associated with at least one order to buy the commodity at a price different than the highest bid price currently available in the market; and

dynamically displaying a fourth indicator at one of the plurality of locations in the ask display region, the fourth indicator representing quantity associated with at least one order to sell the commodity at a price different than the lowest ask price currently available in the market.

12. The method of claim 11 wherein a location of the plurality of locations of the bid display region comprises a blank region in which there is no first or third indicator displayed.

13. The method of claim 1 wherein a location of the plurality of locations of the ask display region comprises a blank region in which there is no second or fourth indicator displayed.

14. The method of claim 1 wherein the order entry region comprises:

a bid order entry region comprising a plurality of locations for receiving commands to send buy orders, each location corresponding to a price level along the common static price axis; and

an ask order entry region comprising a plurality of locations for receiving commands to send sell orders, each location corresponding to a price level along the common static price axis.

15. The method of claim 14 wherein the bid order entry region overlaps with the bid display region and the ask order entry region overlaps with the ask display region.

16. The method of claim 1 further comprising dynamically displaying an entered order indicator in association with the price levels arranged along the common static price axis.

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17. The method of claim 16 wherein the entered order indicator is displayed in an entered order region.

18. The method of claim 1 further comprising dynamically displaying a last trade indicator in association with the common static price axis.

19. The method of claim 18 wherein the last trade indicator is displayed in a last trade region.

20. The method of claim 1 further comprising the steps of: displaying the first indicator at a first location associated with a first price level on the common static price axis at a first time; and

displaying the first indicator at a second location associated with a different price level on the common static price axis at a second time subsequent to the first time.

21. The method of claim 1 further comprising the steps of: displaying the second indicator at a first location associated with a first price level on the common static price axis at a first time; and

displaying the second indicator at a second location associated with a different price level on the common static price axis at a second time subsequent to the first time.

22. The method of claim 1 further comprising the steps of: displaying the first indicator at a first location associated with a particular price level on the common static price axis; and

repositioning the common static price axis such that the first indicator is displayed at a second location associated with the particular price level on the common static price axis.

23. The method of claim 1 further comprising the steps of: displaying the second indicator at a first location associated with a particular price level on the common static price axis; and

repositioning the common static price axis such that the second indicator is displayed at a second location associated with the particular price level on the common static price axis.

24. The method of claim 1 wherein the bid and ask display regions are displayed in different colors.

25. The method of claim 1 wherein the first and second indicators are displayed in different colors.

26. The method of claim 1 wherein the bid and ask display regions are displayed in a window further comprising centering the display of the first and second indicators in the window upon receipt of a centering instruction.

27. A computer readable medium having program code recorded thereon for execution on a computer for displaying market information relating to and facilitating trading of a commodity being traded in an electronic exchange having an inside market with a highest bid price and a lowest ask price on a graphical user interface, the program code causing a machine to perform the following method steps:

dynamically displaying a first indicator in one of a plurality of locations in a bid display region, each location in the bid display region corresponding to a price level along a common static price axis, the first indicator representing quantity associated with at least one order to buy the commodity at the highest bid price currently available in the market;

dynamically displaying a second indicator in one of a plurality of locations in an ask display region, each location in the ask display region corresponding to a price level along the common static price axis, the second indicator representing quantity associated with at least one order to sell the commodity at the lowest ask price currently available in the market;

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displaying the bid and ask display regions in relation to fixed price levels positioned along the common static price axis such that when the inside market changes, the price levels along the common static price axis do not move and at least one of the first and second indicators moves in the bid or ask display regions relative to the common static price axis;

displaying an order entry region comprising a plurality of locations for receiving commands to send trade orders, each location corresponding to a price level along the common static price axis; and

in response to a selection of a particular location of the order entry region by a single action of a user input device, setting a plurality of parameters for a trade order relating to the commodity and sending the trade order to the electronic exchange.

28. The method of claim **11** wherein the first and third indicators are displayed in locations of the bid display region that are arranged along an axis which is parallel to the common static price axis.

29. The method of claim **11** wherein the second and fourth indicators are displayed in locations of the ask display region that are arranged along an axis which is parallel to the common static price axis.

30. The method of claim **11** comprising the steps of:

displaying the first indicator at a first location associated with a first price level on the common static price axis at a first time; and

displaying the first indicator at a second location associated with a different price level on the common static price axis at a second time subsequent to the first time.

31. The method of claim **30** wherein the third and fourth indicators remain in the same location in the bid and ask display regions, respectively, before and after the first indicator is displayed at the second location.

32. The method of claim **31** wherein each location of the bid display region corresponds to a different price level along the common static price axis and each location of the ask display region corresponds to a different price level along the common static price.

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33. The method of claim **11** comprising the steps of: displaying the second indicator at a first location associated with a first price level on the common static price axis at a first time; and

displaying the second indicator at a second location associated with a different price level on the common static price axis at a second time subsequent to the first time.

34. The method of claim **33** wherein the third and fourth indicators remain in the same location in the bid and ask display regions, respectively, before and after the second indicator is displayed at the second location.

35. The method of claim **34** wherein each location of the bid display region corresponds to a different price level along the common static price axis and each location of the ask display region corresponds to a different price level along the common static price.

36. The method of claim **1** wherein the bid and ask display regions are displayed separately.

37. The method of claim **1** wherein the first and second indicators are based on an exchange order book and wherein the price levels along the common static price axis do not move in response to the addition of a price to the exchange order book, the additional price comprising a price for which there is a corresponding displayed location in at least one of the bid and ask display regions.

38. The method of claim **37** wherein the price levels along the common static price axis do not move in response to the removal of a price from the exchange order book, the removed price comprising a price for which there is a corresponding displayed location in at least one of the bid and ask display regions.

39. The method of claim **1** wherein the first and second indicators are based on an exchange order book and the price levels along the common static price axis never move in response to a price change in the exchange order book relating to a price which corresponds to a displayed location in at least one of the bid and ask display regions.

40. The method of claim **1** the plurality of parameters comprises a price and type of order.

* * * * *

UNITED STATES PATENT AND TRADEMARK OFFICE
CERTIFICATE OF CORRECTION

PATENT NO. : 6,766,304 B2

Page 1 of 1

DATED : July 20, 2004

INVENTOR(S) : Gary Allan Kemp II, Jens-Uwe Schluetter and Harris Brumfield

It is certified that error appears in the above-identified patent and that said Letters Patent is hereby corrected as shown below:

Title page,

Item [56], **References Cited**, U.S. PATENT DOCUMENTS, add the following:

-- 4,903,201 A 2/1990 Wagner
5,101,353 A 3/1992 Lupien et al.
5,946,667 A 8/1999 Tull, Jr., et al.
6,035,287 A 3/2000 Stallaert et al.
2002/0138401 A1 9/2002 Allen et al. --

FOREIGN PATENT DOCUMENTS, add the following:

-- WO WO 95/35005 9/1995 --

Column 14,

Line 64, the word "Static" should be -- static --.

Column 15,

Line 26, after "claim 11" add the word -- further --.

Column 16,

Line 1, after "claim 11" add the word -- further --.

Line 10, the word "an" should be -- and --.

Line 40, after "claim 1" add -- wherein --.

Signed and Sealed this

Sixteenth Day of November, 2004



JON W. DUDAS
Director of the United States Patent and Trademark Office



US006766304C1

(12) EX PARTE REEXAMINATION CERTIFICATE (6739th)
United States Patent (10) Number: US 6,766,304 C1
Kemp, II et al. (45) Certificate Issued: Mar. 31, 2009

(54)	CLICK BASED TRADING WITH INTUITIVE GRID DISPLAY OF MARKET DEPTH	6,343,278 B1 6,421,653 B1 2003/0097325 A1	1/2002 7/2002 5/2003	Jain et al. May Friesen et al.
(75)	Inventors: Gary Allan Kemp, II , Winnetka, IL (US); Jens-Uwe Schluetter , Evanston, IL (US); Harris Brumfield , Chicago, IL (US)			FOREIGN PATENT DOCUMENTS
(73)	Assignee: Trading Technologies International	EP WO WO WO	1319211 B1 WO 91/14231 WO/99/19821 WO 99/53424	2/2001 9/1991 4/1999 4/1999

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(60) Provisional application No. 60/186,322, filed on Mar. 2, 2000.

(51) **Int. Cl.**
G06Q 40/00 (2006.01)
G06F 3/048 (2006.01)

(52) **U.S. Cl.** 705/36 R; 705/35; 715/814
(58) **Field of Classification Search** None
See application file for complete search history.

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Primary Examiner—Jeanne M. Clark

ABSTRACT

A method and system for reducing the time it takes for a trader to place a trade when electronically trading on an exchange, thus increasing the likelihood that the trader will have orders filled at desirable prices and quantities. The "Mercury" display and trading method of the present invention ensure fast and accurate execution of trades by displaying market depth on a vertical or horizontal plane, which fluctuates logically up or down, left or right across the plane as the market prices fluctuate. This allows the trader to trade quickly and efficiently.

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**EX PARTE
REEXAMINATION CERTIFICATE
ISSUED UNDER 35 U.S.C. 307**

NO AMENDMENTS HAVE BEEN MADE TO
THE PATENT

2

AS A RESULT OF REEXAMINATION, IT HAS BEEN
DETERMINED THAT:

⁵ The patentability of claims **1–40** is confirmed.

* * * * *



(12) **United States Patent**
Kemp, II et al.

(10) **Patent No.:** US 7,813,996 B2
(45) **Date of Patent:** Oct. 12, 2010

(54) **CLICK BASED TRADING WITH INTUITIVE GRID DISPLAY OF MARKET DEPTH**

(75) Inventors: **Gary Allan Kemp, II**, Winnetka, IL (US); **Jens-Uwe Schluetter**, Evanston, IL (US); **Harris Brumfield**, Chicago, IL (US)

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(73) Assignee: **Trading Technologies International, Inc.**, Chicago, IL (US)

(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 210 days.

(21) Appl. No.: 11/415,163

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(65) **Prior Publication Data**

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(51) **Int. Cl.**

G06Q 40/00 (2006.01)

(52) **U.S. Cl.** 705/37

(58) **Field of Classification Search** 705/35-45
See application file for complete search history.

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Tokyo Stock Exchange, Futures/Options Trading System, figure 9-5.*

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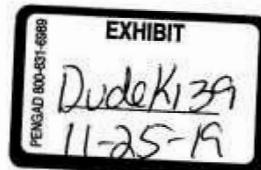
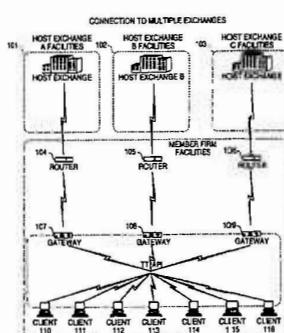
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Primary Examiner—Richard C Weisberger
(74) Attorney, Agent, or Firm—McDonnell Boehnen Hulbert & Berghoff LLP

(57) **ABSTRACT**

A method and system for reducing the time it takes for a trader to place a trade when electronically trading on an exchange, thus increasing the likelihood that the trader will have orders filled at desirable prices and quantities. The "Mercury" display and trading method of the present invention ensure fast and accurate execution of trades by displaying market depth on a vertical or horizontal plane, which fluctuates logically up or down, left or right across the plane as the market prices fluctuates. This allows the trader to trade quickly and efficiently.

20 Claims, 6 Drawing Sheets



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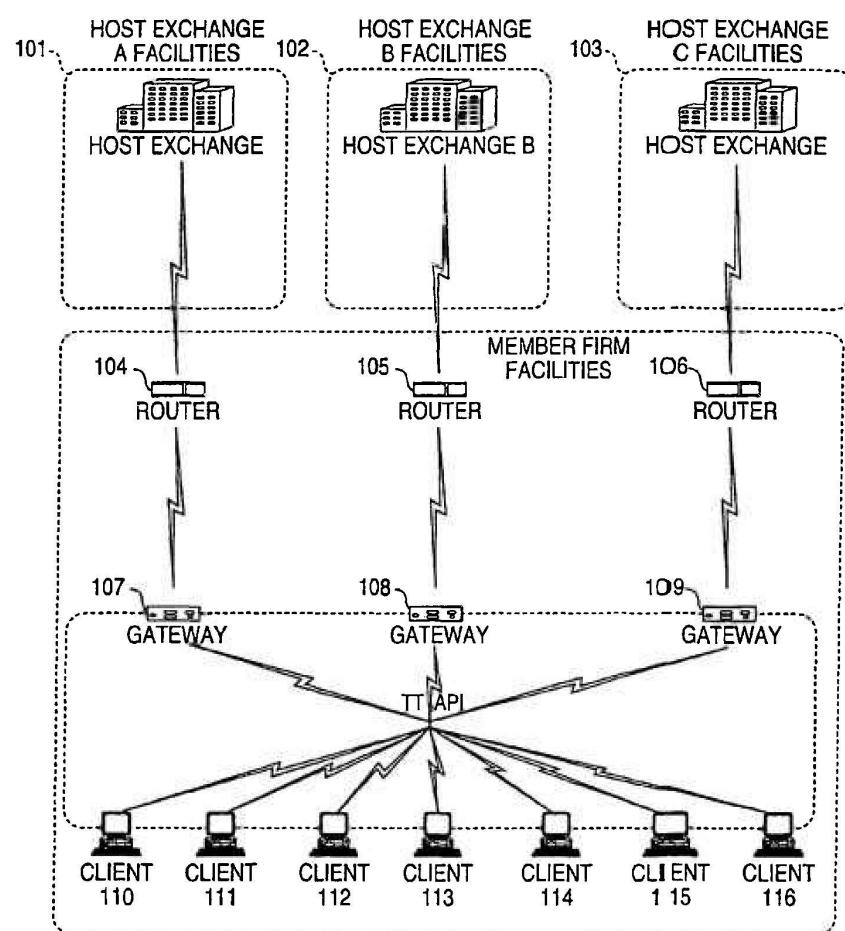
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FIG. 1

CONNECTION TO MULTIPLE EXCHANGES



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FIG. 2

	Contract	Depth	BidQty	BidPrc	AskPrc	AskQty	LastPrc	LastQty	Total
1	CDHO	*	785	7626	7627	21	7627	489	8230
2			626	7625	7629	815			
3			500	7624	7630	600			
4			500	7623	7631	2456			
5			200	7622	7632	800			

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FIG. 3

SYCOM FGBL DEC99

E/W	10:48:44	BidQ	AskQ	Prc	LTQ
1009	L 3		104	99	
1010	R 5		24	98	
1011	720		33	97	
1012	X 10		115	96	
1013	0		32	95	
1014	10 1H		27	94	
	50 3H		63	93	
1007	S 0 W 24	1K 5H		45	92
	S 0 W 7	CLR		28	91
1015	X 10		20	90	10
1016	17 ▽		18	89	
1008	B 0 W 15	CXL	97	88	
	B 0 W 13	+ -	30	87	
1017	NET 0		43	86	
1018	B 0 W 17	NET REAL	110	85	
1019			23	84	
1021			31	83	
			125	82	
			21	81	
			1001	1002	1003
			1004	1005	1006

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FIG. 4

SYCOM FGBL DEC99

E/W	10:48:44		BidQ	AskQ	Prc	LTQ
	L	3		104	99	
	R	5		24	98	
	720			33	97	
	X	10		115	96	
	0			32	95	
	10	1H		27	94	
	50	3H		63	93	10
S 10 W 14	1K	5H	43		92	
	CLR					
	X	10	125		91	
	17	▼	97		90	
B 0 W 15	CXL		18		89	
B 0 W 13	+/-		97		88	
	NET 0		30		87	
B 0 W 17	NET REAL		43		86	
			110		85	
			23		84	
			31		83	
			125		82	
			21		81	

1101

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Appx365

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DTX00848.0010

Appx2470

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FIG. 5

SYCOM FGBL DEC99

E/W	10:48:44	BidQ	AskQ	Prc	LTQ
L	3		104	99	
R	5		24	98	
	720		33	97	
X	10		115	96	
	0		32	95	
10	1H		27	94	
50	3H		63	93	
S 0 W 24	1K 5H		45	92	
S 0 W 7	CLR		28	91	
	X 10		20	90	10
17	▼		18		89
B 0 W 15	CXL		97		88
B 0 W 13	[+]		30		87
	NET 0		43		86
B 0 W 17	NET REAL		110		85
			23		84
			31		83
			125		82
			21		81

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Appx2471

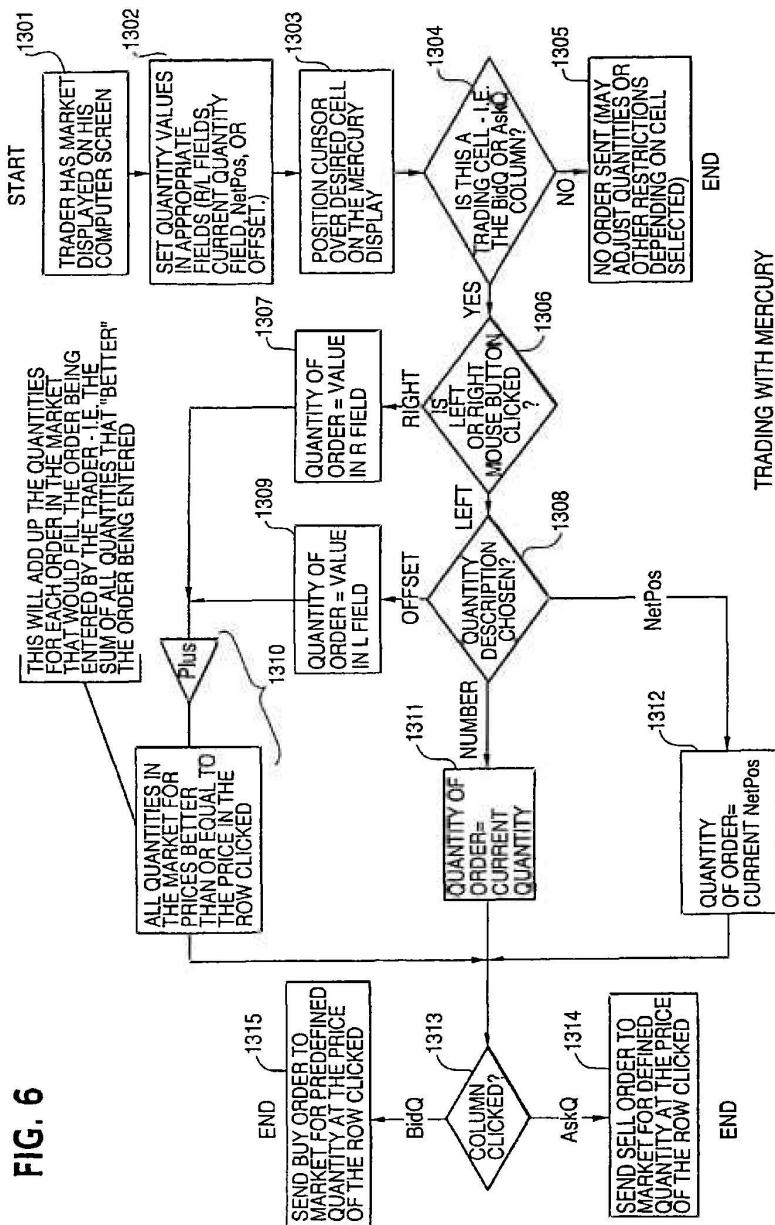
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Appx367

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1**CLICK BASED TRADING WITH INTUITIVE GRID DISPLAY OF MARKET DEPTH****PRIORITY**

The present application claims priority to a U.S. Provisional Patent Application 60/186,322 entitled "Market Depth Display Click Based Trading and Mercury Display" filed Mar. 2, 2000, the contents of which are incorporated herein by reference.

FIELD OF THE INVENTION

The present invention is directed to the electronic trading of commodities. Specifically, the invention provides a trader with a versatile and efficient tool for executing trades. It facilitates the display of and the rapid placement of trade orders within the market trading depth of a commodity, where a commodity includes anything that can be traded with quantities and/or prices.

BACKGROUND OF THE INVENTION

At least 60 exchanges throughout the world utilize electronic trading in varying degrees to trade stocks, bonds, futures, options and other products. These electronic exchanges are based on three components: mainframe computers (host), communications servers, and the exchange participants' computers (client). The host forms the electronic heart of the fully computerized electronic trading system. The system's operations cover order-matching, maintaining order books and positions, price information, and managing and updating the database for the online trading day as well as nightly batch runs. The host is also equipped with external interfaces that maintain uninterrupted online contact to quote vendors and other price information systems.

Traders can link to the host through three types of structures: high speed data lines, high speed communications servers and the Internet. High speed data lines establish direct connections between the client and the host. Another connection can be established by configuring high speed networks or communications servers at strategic access points worldwide in locations where traders physically are located. Data is transmitted in both directions between traders and exchanges via dedicated high speed communication lines. Most exchange participants install two lines between the exchange and the client site or between the communication server and the client site as a safety measure against potential failures. An exchange's internal computer system is also often installed with backups as a redundant measure to secure system availability. The third connection utilizes the Internet. Here, the exchange and the traders communicate back and forth through high speed data lines, which are connected to the Internet. This allows traders to be located anywhere they can establish a connection to the Internet.

In irrespective of the way in which a connection is established, the exchange participants' computers allow traders to participate in the market. They use software that creates specialized interactive trading screens on the traders' desktops. The trading screens enable traders to enter and execute orders, obtain market quotes, and monitor positions. The range and quality of features available to traders on their screens varies according to the specific software application being run. The installation of open interfaces in the development of an exchange's electronic strategy means users can choose, depending on their trading style and internal requirements, the means by which they will access the exchange.

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The world's stock, bond, futures and options exchanges have volatile products with prices that move rapidly. To profit in these markets, traders must be able to react quickly. A skilled trader with the quickest software, the fastest communications, and the most sophisticated analytics can significantly improve his own or his firm's bottom line. The slightest speed advantage can generate significant returns in a fast moving market. In today's securities markets, a trader lacking a technologically advanced interface is at a severe competitive disadvantage.

Irrespective of what interface a trader uses to enter orders in the market, each market supplies and requires the same information to and from every trader. The bids and asks in the market make up the market data and everyone logged on to trade can receive this information if the exchange provides it. Similarly, every exchange requires that certain information be included in each order. For example, traders must supply information like the name of the commodity, quantity, restrictions, price and multiple other variables. Without all of this information, the market will not accept the order. This input and output of information is the same for every trader.

With these variables being constant, a competitive speed advantage must come from other aspects of the trading cycle. When analyzing the time it takes to place a trade order for a given commodity, various steps contribute in different amounts to the total time required. Approximately 8% of the total time it takes to enter an order elapses between the moment the host generates the price for the commodity and the moment the client receives the price. The time it takes for the client application to display the price to the trader amounts to approximately 4%. The time it takes for a trade order to be transmitted to the host amounts to approximately 8%. The remainder of the total time it takes to place an order, approximately 80%, is attributable to the time required for the trader to read the prices displayed and to enter a trade order. The present invention provides a significant advantage during the slowest portion of the trading cycle—while the trader manually enters his order. Traders recognize that the value of time savings in this portion may amount to millions of dollars annually.

In existing systems, multiple elements of an order must be entered prior to an order being sent to market, which is time consuming for the trader. Such elements include the commodity symbol, the desired price, the quantity and whether a buy or a sell order is desired. The more time a trader takes entering an order, the more likely the price on which he wanted to bid or offer will change or not be available in the market. The market is fluid as many traders are sending orders to the market simultaneously. In fact, successful markets strive to have such a high volume of trading that any trader who wishes to enter an order will find a match and have the order filled quickly, if not immediately. In such liquid markets, the prices of the commodities fluctuate rapidly. On a trading screen, this results in rapid changes in the price and quantity fields within the market grid. If a trader intends to enter an order at a particular price, but misses the price because the market prices moved before he could enter the order, he may lose hundreds, thousands, even millions of dollars. The faster a trader can trade, the less likely it will be that he will miss his price and the more likely he will make money.

SUMMARY OF THE INVENTION

The inventors have developed the present invention which overcomes the drawbacks of the existing trading systems and dramatically reduces the time it takes for a trader to place a trade when electronically trading on an exchange. This, in

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turn, increases the likelihood that the trader will have orders filled at desirable prices and quantities.

The "Mercury" display and trading method of the present invention ensure fast and accurate execution of trades by displaying market depth on a vertical or horizontal plane, which fluctuates logically up or down, left or right across the plane as the market prices fluctuate. This allows the trader to trade quickly and efficiently.

Specifically, the present invention is directed to a graphical user interface for displaying the market depth of a commodity traded in a market, including a dynamic display for a plurality of bids and for a plurality of asks in the market for the commodity and a static display of prices corresponding to the plurality of bids and asks. In this embodiment the pluralities of bids and asks are dynamically displayed in alignment with the prices corresponding thereto. Also described herein is a method and system for placing trade orders using such displays.

These embodiments, and others described in greater detail herein, provide the trader with improved efficiency and versatility in placing, and thus executing, trade orders for commodities in an electronic exchange. Other features and advantages of the present invention will become apparent to those skilled in the art from the following detailed description. It should be understood, however, that the detailed description and specific examples, while indicating preferred embodiments of the present invention, are given by way of illustration and not limitation. Many changes and modifications within the scope of the present invention may be made without departing from the spirit thereof, and the invention includes all such modifications.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 illustrates the network connections between multiple exchanges and client sites;

FIG. 2 illustrates screen display showing the inside market and the market depth of a given commodity being traded;

FIG. 3 illustrates the Mercury display of the present invention;

FIG. 4 illustrates the Mercury display at a later time showing the movement of values when compared to FIG. 3;

FIG. 5 illustrates a Mercury display with parameters set in order to exemplify the Mercury trading method; and

FIG. 6 is a flowchart illustrating the process for Mercury display and trading.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

As described with reference to the accompanying figures, the present invention provides a display and trading method to ensure fast and accurate execution of trades by displaying market depth on a vertical or horizontal plane, which fluctuates logically up or down, left or right across the plane as the market prices fluctuate. This allows the trader to place trade orders quickly and efficiently. A commodity's market depth is the current bid and ask prices and quantities in the market. The display and trading method of the invention increase the likelihood that the trader will be able to execute orders at desirable prices and quantities.

In the preferred embodiment, the present invention is implemented on a computer or electronic terminal. The computer is able to communicate either directly or indirectly (using intermediate devices) with the exchange to receive and transmit market, commodity, and trading order information. It is able to interact with the trader and to generate contents

and characteristics of a trade order to be sent to the exchange. It is envisioned that the system of the present invention can be implemented on any existing or future terminal or device with the processing capability to perform the functions described herein. The scope of the present invention is not limited by the type of terminal or device used. Further, the specification refers to a single click of a mouse as a means for user input and interaction with the terminal display as an example of a single action of the user. While this describes a preferred mode of interaction, the scope of the present invention is not limited to the use of a mouse as the input device or to the click of a mouse button as the user's single action. Rather, any action by a user within a short period of time, whether comprising one or more clicks of a mouse button or other input device, is considered a single action of the user for the purposes of the present invention.

The system can be configured to allow for trading in a single or in multiple exchanges simultaneously. Connection of the system of the present invention with multiple exchanges is illustrated in FIG. 1. This figure shows multiple host exchanges 101-103 connected through routers 104-106 to gateways 107-109. Multiple client terminals 110-116 for use as trading stations can then trade in the multiple exchanges through their connection to the gateways 107-109. When the system is configured to receive data from multiple exchanges, then the preferred implementation is to translate the data from various exchanges into a simple format. This "translation" function is described below with reference to FIG. 1. An applications program interface ("TT API" as depicted in the figure) translates the incoming data formats from the different exchanges to a simple preferred data format. This translation function may be disposed anywhere in the network, for example, at the gateway server, at the individual workstations or at both. In addition, the storage at gateway servers and at the client workstations, and/or other external storage cache historical data such as order books which list the client's active orders in the market; that is, those orders that have neither been filled nor cancelled. Information from different exchanges can be displayed at one or in multiple windows at the client workstation. Accordingly, while reference is made through the remainder of the specification to a single exchange to which a trading terminal is connected, the scope of the invention includes the ability to trade, in accordance with the trading methods described herein, in multiple exchanges using a single trading terminal.

The preferred embodiments of the present invention include the display of "Market Depth" and allow traders to view the market depth of a commodity and to execute trades within the market depth with a single click of a computer mouse button. Market Depth represents the order book with the current bid and ask prices and quantities in the market. In other words, Market Depth is each bid and ask that was entered into the market, subject to the limits noted below, in addition to the inside market. For a commodity being traded, the "inside market" is the highest bid price and the lowest ask price.

The exchange sends the price, order and fill information to each trader on the exchange. The present invention processes this information and maps it through simple algorithms and mapping tables to positions in a theoretical grid program or any other comparable mapping technique for mapping data to a screen. The physical mapping of such information to a screen grid can be done by any technique known to those skilled in the art. The present invention is not limited by the method used to map the data to the screen display.

How far into the market depth the present invention can display depends on how much of the market depth the

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exchange provides. Some exchanges supply an infinite market depth, while others provide no market depth or only a few orders away from the inside market. The user of the present invention can also chose how far into the market depth to display on his screen.

FIG. 2 illustrates a screen display of an invention described in a commonly owned co-pending application entitled "Click Based Trading with Market Depth Display" Ser. No. 11/061, 554, filed on Feb. 18, 2005, the contents of which are incorporated herein by reference. This display shows the inside market and the market depth of a given commodity being traded. Row 1 represents the "inside market" for the commodity being traded which is the best (highest) bid price and quantity and the best (lowest) ask price and quantity. Rows 2-5 represent the "market depth" for the commodity being traded. In the preferred embodiment of the present invention, the display of market depth (rows 2-5) lists the available next-best bids, in column 203, and asks, in column 204. The working bid and ask quantity for each price level is also displayed in columns 202 and 205 respectively (inside market—row 1). Prices and quantities for the inside market and market depth update dynamically on a real time basis as such information is relayed from the market.

In the screen display shown in FIG. 2, the commodity (contract) being traded is represented in row 1 by the character string "CDOH". The Depth column 208 will inform the trader of a status by displaying different colors. Yellow indicates that the program application is waiting for data. Red indicates that the Market Depth has failed to receive the data from the server and has "timed out." Green indicates that the data has just been updated. The other column headings in this and all of the other figures, are defined as follows. BidQty (Bid Quantity): the quantity for each working bid, BidPrc (Bid Price): the price for each working bid, AskPrc (Ask Price): the price for each working ask, AskQty (Ask Quantity): the quantity for each working ask, LastPrc (Last Price): the price for the last bid and ask that were matched in the market and LastQty (Last Quantity): the quantity traded at the last price. Total represents the total quantity traded of the given commodity.

The configuration of the screen display itself informs the user in a more convenient and efficient manner than existing systems. Traders gain a significant advantage by seeing the market depth because they can see trends in the orders in the market. The market depth display shows the trader the interest the market has in a given commodity at different price levels. If a large amount of bids or asks are in the market near the trader's position, he may feel he should sell or buy before the inside market reaches the morass of orders. A lack of orders above or below the inside market might prompt a trader to enter orders near the inside market. Without seeing the market depth, no such strategies could be utilized. Having the dynamic market depth, including the bid and ask quantities and prices of a traded commodity aligned with and displayed below the current inside market of the commodity conveys the information to the user in a more intuitive and easily understandable manner. Trends in the trading of the commodity and other relevant characteristics are more easily identifiable by the user through the use of the present invention.

Various abbreviations are used in the screen displays, and specifically, in the column headings of the screen displays reproduced herein. Some abbreviations have been discussed above. A list of common abbreviations and their meanings is provided in Table 1.

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TABLE I

COLUMN	DESCRIPTION
Month	Expiration Month/Year
Bid Mbr ₍₁₎	Bid Member ID
WrkBuys ₍₂₎	Working Buys for entire Group
ID	ID
BidQty	Bid Quantity
ThrshBld ₍₆₎	Threshold Bid Price
BidPrc	Bid Price
Bid Qty Accum	Accumulated Bid Quantity
BidPrc Avg	Bid Price Average
AskPrc Avg	Ask Price Average
AskQty Accum	Accumulated Ask Quantity
AskPrc	Ask Price
ThrshAsk ₍₆₎	Threshold Ask Price
AskQty	Ask Quantity
WrkSells ₍₂₎	Working Sells for entire Group
ID	ID
Ask Mbr ₍₁₎	Ask Member ID
NetPos	Net Position
FFNetPos	Fast Fill Net Position
LastPrc	Last Price
LastQty	Last Quantity
Total	Total Traded Quantity
High	High Price
Low	Low Price
Open	Opening Price
Close	Closing Price
Chng	Last Price - Last Close
TheoPrc	Theoretical Price
TheoBid	Theoretical Bid Price
TheoAsk	Theoretical Ask Price
QAct	Quote Action (Sends individual quotes)
BQQ	Test Bid Quote Quantity
BQP	Test Bid Quote Price
Mkt BQQ	Market Bid Quote Quantity
Mkt BQP	Market Bid Quote Price
Quote	Checkbox activates/deactivates contract for quoting
Mkt.AQQ	Market Ask Quote Quantity
Mkt.AQP	Market Ask Quote Price
AQP	Ask Quote Price
AQQ	Ask Quote Quantity
Imp BidQty ₍₅₎	Implied Bid Quantity
Imp BidPrc ₍₅₎	Implied Bid Price
Imp AskQty ₍₅₎	Implied Ask Quantity
Imp AskPrc ₍₅₎	Implied Ask Price
Gamma ₍₃₎	Change in Delta given 1 pt
Delta ₍₃₎	change in underlying
Vola ₍₃₎	Change in price given 1 pt
Vega ₍₃₎	change in underlying
Rho ₍₃₎	Percent volatility
Theta ₍₃₎	Price change given 1%
Click Trd	change in Vola
S (Status)	Price change given 1%
	change in interest rate
	Price change for every day that elapses
	Activate/deactivate click trading by contract
	Auction, Closed, FastMkt, Not Tradable, Pre-trading, Tradable, S = post-trading
Expiry	Expiration Month/Year

As described herein, the display and trading method of the present invention provide the user with certain advantages over systems in which a display of market depth, as shown in FIG. 2, is used. The Mercury display and trading method of the present invention ensure fast and accurate execution of trades by displaying market depth on a vertical or horizontal plane, which fluctuates logically up or down, left or right across the plane as the market prices fluctuates. This allows

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the trader to trade quickly and efficiently. An example of such a Mercury display is illustrated in the screen display of FIG. 3.

The display of market depth and the manner in which traders trade within the market depth can be effected in different manners, which many traders will find materially better, faster and more accurate. In addition, some traders may find the display of market depth to be difficult to follow. In the display shown in FIG. 2, the market depth is displayed vertically so that both Bid and Ask prices descend the grid. The Bid prices descend the market grid as the prices decrease. Ask prices also descend the market grid as these prices actually increase. This combination may be considered counterintuitive and difficult to follow by some traders.

The Mercury display overcomes this problem in an innovative and logical manner. Mercury also provides an order entry system, market grid, fill window and summary of market orders in one simple window. Such a condensed display materially simplifies the trading system by entering and tracking trades in an extremely efficient manner. Mercury displays market depth in a logical, vertical fashion or horizontally or at some other convenient angle or configuration. A vertical field is shown in the figures and described for convenience, but the field could be horizontal or at an angle. In turn, Mercury further increases the speed of trading and the likelihood of entering orders at desired prices with desired quantities. In the preferred embodiment of the invention, the Mercury display is a static vertical column of prices with the bid and ask quantities displayed in vertical columns to the side of the price column and aligned with the corresponding bid and ask prices. An example of this display is shown in FIG. 3.

Bid quantities are in the column 1003 labeled BidQ and ask quantities are in column 1004 labeled AskQ. The representative ticks from prices for the given commodity are shown in column 1005. The column does not list the whole prices (e.g. 95.89), but rather, just the last two digits (e.g. 89). In the example shown, the inside market, cells 1020, is 18 (best bid quantity) at 89 (best bid price) and 20 (best ask quantity) at 90 (best ask price). In the preferred embodiment of the invention, these three columns are shown in different colors so that the trader can quickly distinguish between them.

The values in the price column are static; that is, they do not normally change positions unless a re-centering command is received (discussed in detail later). The values in the Bid and Ask columns however, are dynamic; that is, they move up and down (in the vertical example) to reflect the market depth for the given commodity. The LTQ column 1006 shows the last traded quantity of the commodity. The relative position of the quantity value with respect to the Price values reflects the price at which that quantity was traded. Column 1001 labeled E/W (entered/working) displays the current status of the trader's orders. The status of each order is displayed in the price row where it was entered. For example, in cells 1007, the number next to S indicates the number of the trader's ordered lots that have been sold at the price in the specific row. The number next to W indicates the number of the trader's ordered lots that are in the market, but have not been filled—i.e. the system is working on filling the order. Blanks in this column indicate that orders are entered or working at that price. In cells 1008, the number next to B indicates the number of the trader's ordered lots that have been bought at the price in the specific row. The number next to W indicates the number of the trader's ordered lots that are in the market, but have not been filled—i.e. the system is working on filling the order.

Various parameters are set and information is provided in column 1002. For example, "10:48:44" in cell 1009 shows the actual time of day. The L and R fields in cell 1010 indicate a

quantity value, which may be added to the order quantity entered. This process is explained below with respect to trading under Mercury. Below the L and R fields, in cell 1011, a number appears which represents the current market volume. This is the number of lots that have been traded for the chosen contract. Cell 1012, "x10", displays the Net Quantity, the current position of the trader on the chosen contract. The number "10" represents the trader's buys minus sells. Cell 1013 is the "Current Quantity"; this field represents the quantity for the next order that the trader will send to market. This can be adjusted with right and left clicks (up and down) or by clicking the buttons which appear below the Current Quantity in cells 1014. These buttons increase the current quantity by the indicated amount; for example, "10" will increase it by 10; "11" will increase it by 100; "1K" will increase it by 1000. Cell 1015 is the Clear button; clicking this button will clear the Current Quantity field. Cell 1016 is the Quantity Description; this is a pull down menu allowing the trader to choose from three Quantity Descriptions. The pull down menu is displayed when the arrow button in the window is clicked. The window includes NetPos, Offset and a field allowing the trader to enter numbers. Placing a number in this field will set a default buy or sell quantity. Choosing "Offset" in this field will enable the L/R buttons of cell 1010. Choosing "NetPos" in this field will set the current Net Quantity (trader's net position) as the trader's quantity for his next trade. Cell 1017 are +/- buttons; these buttons will alter the size of the screen—either larger (+) or smaller (-). Cell 1018 is used to invoke Net 0; clicking this button will reset the Net Quantity (cell 1011) to zero. Cell 1019 is used to invoke Net Real; clicking this button will reset the Net Quantity (cell 1011) to its actual position.

The inside market and market depth ascend and descend as prices in the market increase and decrease. For example, FIG. 4 shows a screen displaying the same market as that of FIG. 3 but at a later interval where the inside market, cells 1101, has risen three ticks. Here, the inside market for the commodity is 43 (best bid quantity) at 92 (best bid price) and 63 (best ask quantity) at 93 (best ask price). In comparing FIGS. 3 and 4, it can be seen that the price column remained static, but the corresponding bids and asks rose up the price column. Market Depth similarly ascends and descends the price column, leaving a vertical history of the market.

As the market ascends or descends the price column, the inside market might go above or below the price column displayed on a trader's screen. Usually a trader will want to be able to see the inside market to assess future trades. The system of the present invention addresses this problem with a one click centering feature. With a single click at any point within the gray area, 1021, below the "Net Real" button, the system will re-center the inside market on the trader's screen. Also, when using a three-button mouse, a click of the middle mouse button, irrespective of the location of the mouse pointer, will re-center the inside market on the trader's screen.

The same information and features can be displayed and enabled in a horizontal fashion. Just as the market ascends and descends the vertical Mercury display shown in FIGS. 3 and 4, the market will move left and right in the horizontal Mercury display. The same data and the same information gleaned from the dynamical display of the data is provided. It is envisioned that other orientations can be used to dynamically display the data and such orientations are intended to come within the scope of the present invention.

Next, trading commodities, and specifically, the placement of trade orders using the Mercury display is described. Using the Mercury display and trading method, a trader would first designate the desired commodity and, if applicable, the

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default quantities. Then he can trade with single clicks of the right or left mouse button. The following equations are used by the system to generate trade orders and to determine the quantity and price to be associated with the trade order. The following abbreviations are used in these formulas: P=Price value of row clicked, R=Value in R field, L=Value in L field, Q=Current Quantity, Q_b=Total of all quantities in AskQ column at an equal or better price than P, Q_s=Total of all quantities in BidQ column at an equal or better price than P, N=Current Net Position, Bo=Buy order sent to market and So=Sell order sent to market.

Any order entered using right mouse button

$$Bo = (Q_s + R)P$$

(Eq. 1) If BidQ field clicked.

$$So = (Q_b + R)P$$

(Eq. 2) If AskQ field clicked.

Orders entered using the left mouse button

If "Offset" mode chosen in Quantity Description field then:

$$Bo = (Q_s + L)P$$

(Eq. 3) If BidQ field clicked.

$$So = (Q_b + L)P$$

(Eq. 4) If AskQ field clicked.

If "number" mode chosen in Quantity Description field then:

$$Bo = QP$$

(Eq. 5)

$$So = QP$$

(Eq. 6)

If "NetPos" mode chosen in Quantity Description field then:

$$Bo = NP$$

(Eq. 7)

$$So = NP$$

(Eq. 8)

Orders can also be sent to market for quantities that vary according to the quantities available in the market; quantities preset by the trader; and which mouse button the trader clicks. Using this feature, a trader can buy or sell all of the bids or asks in the market at or better than a chosen price with one click. The trader could also add or subtract a preset quantity from the quantities outstanding in the market. If the trader clicks in a trading cell—i.e. in the BidQ or AskQ column, he will enter an order in the market. The parameters of the order depend on which mouse button he clicks and what preset values he set.

Using the screen display and values from FIG. 5, the placement of trade orders using the Mercury display and trading method is now described using examples. A left click on the 18 in the BidQ column 1201 will send an order to market to sell 17 lots (quantity # chosen on the Quantity Description pull down menu 1204) of the commodity at a price of 89 (the corresponding price in the Prc column 1203). Similarly, a left click on the 20 in the AskQ column 1202 will send an order to market to buy 17 lots at a price of 90.

Using the right mouse button, an order would be sent to market at the price that corresponds to the row clicked for the total quantity of orders in the market that equal or better the price in that row plus the quantity in the R field 1205. Thus, a right click in the AskQ column 1202 in the 87 price row will send a sell order to market at a price of 87 and a quantity of 150. 150 is the sum of all the quantities 30, 97, 18 and 5. 30, 97 and 18 are all of the quantities in the market that would meet or better the trader's sell order price of 87. These quantities are displayed in the BidQ column 1201 because this column represents the orders outstanding in the market to purchase the commodity at each corresponding price. The quantity 5 is the quantity pre-set in the R field 1205.

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Similarly, a right click in the BidQ column 1201 at the same price level of 87 would send a buy limit order to market for a quantity of 5 at a price of 87. The quantity is determined in the same manner as above. In this example, though, there are no orders in the market that equal or better the chosen price—there are no quantities in the AskQ column 1202 that equal or better this price. Therefore, the sum of the equal or better quantities is zero ("0"). The total order entered by the trader will be the value in the R field, which is 5.

An order entered with the left mouse button and the "Offset" option chosen in the quantity description field 1204 will be calculated in the same way as above, but the quantity in the L field 1206 will be added instead of the quantity in the R field 1205. Thus, a left click in the BidQ column 1201 in the 92 price row will send a buy order to market at a price of 92 and a quantity of 96. 96 is the sum of all the quantities 45, 28, 20 and 3. 45, 28 and 20 are all quantities in the market that would meet or better the trader's buy order price of 92. These quantities are displayed in the AskQ column 1202 because this column represents the orders outstanding in the market to sell the commodity at each corresponding price. The quantity 3 is the quantity pre-set in the L field 1206.

The values in the L or R fields may be negative numbers. This would effectively decrease the total quantity sent to market. In other words, in the example of a right click in the AskQ column 1202 in the 87 price row, if the R field was -5, the total quantity sent to market would be 140 (30+97+18+(-5)).

If a trader chose the "NetPos" option in the quantity description field 1204, a right click would still work as explained above. A left click would enter an order with a price corresponding to the price row clicked and a quantity equal to the current Net position of the trader. The Net position of the trader is the trader's current position on the chosen contract. In other words, if the trader has bought 10 more contracts than he has sold, this value would be 10. NetPos would not affect the quantity of an order sent with a right click.

If the trader chose a number value in the quantity description, a left click would send an order to market for the current quantity chosen by the trader. The default value of the current quantity will be the number entered in the quantity description field, but it could be changed by adjusting the figure in the current quantity field 1204.

This embodiment of the invention also allows a trader to delete all of his working trades with a single click of either the right or left mouse button anywhere in the last traded quantity (LTQ) column 1207. This allows a trader to exit the market immediately. Traders will use this feature when they are losing money and want to stop the losses from piling up. Traders may also use this feature to quickly exit the market upon making a desired profit. The invention also allows a trader to delete all of his orders from the market at a particular price level. A click with either mouse button in the Entered/Working (E/W) column 1208 will delete all working orders in the cell that was clicked. Thus, if a trader believes that previously sent orders at a particular price that have not been filled would be poor trades, he can delete these orders with a single click.

The process for placing trade orders using the Mercury display and trading method of the present invention as described above is shown in the flowchart of FIG. 6. First, in step 1301, the trader has the Mercury display on the trading terminal screen showing the market for a given commodity. In step 1302, the parameters are set in the appropriate fields, such as the L and R fields and the Current Quantity, NetPos or Offset fields from the pull down menu. In step 1303, the mouse pointer is positioned and clicked over a cell in the Mercury display by the trader. In step 1304, the system deter-

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mines whether the cell clicked is a tradeable cell (i.e. in the AskQ column or BidQ column). If not, then in step 1305, no trade order is created or sent and, rather, other quantities are adjusted or functions are performed based upon the cell selected. Otherwise, in step 1306, the system determines whether it was the left or the right button of the mouse that was clicked. If it was the right, then in step 1307, the system will use the quantity in the R field when it determines the total quantity of the order in step 1310. If the left button was clicked, then in step 1308, the system determines which quantity description was chosen: Offset, NetPos or an actual number.

If Offset was chosen, then the system, in step 1309, will use the quantity in the L field when it determines the total quantity of the order in step 1310. If NetPos was chosen, then the system, in step 1312, will determine that the total quantity for the trade order will be current NetPos value, i.e. the net position of the trader in the given commodity. If an actual number was used as the quantity description, then, in step 1311, the system will determine that the total quantity for the trade order will be the current quantity entered. In step 1310, the system will determine that the total quantity for the trade order will be the value of the R field (if step 1307 was taken) or the value of the L field (if step 1309 was taken) plus all quantities in the market for prices better than or equal to the price in the row clicked. This will add up the quantities for each order in the market that will fill the order being entered by the trader (plus the L or R value).

After either steps 1310, 1311 or 1312, the system, in step 1313, determines which column was clicked, BidQ or AskQ. If AskQ was clicked, then, in step 1314, the system sends a sell limit order to the market at the price corresponding to the row for the total quantity as already determined. If BidQ was clicked, then, in step 1315, the system sends a buy limit order to the market at the price corresponding to the row for the total quantity as already determined.

It should be understood that the above description of the invention and specific examples, while indicating preferred embodiments of the present invention, are given by way of illustration and not limitation. Many changes and modifications within the scope of the present invention may be made without departing from the spirit thereof, and the present invention includes all such changes and modifications.

We claim:

1. A computer readable medium having program code recorded thereon for execution on a computer having a graphical user interface and a user input device, the program code causing a machine to perform the following method steps:

receiving market information for a commodity from an electronic exchange, the market information comprising an inside market with a current highest bid price and a current lowest ask price;

receiving an input from a user that designates a default quantity to be used for a plurality of trade orders;

dynamically displaying a first indicator in one of a plurality of locations in a bid display region, each location in the bid display region corresponding to a price level along a static price axis, the first indicator representing quantity associated with at least one order to buy the commodity at the current highest bid price;

dynamically displaying a second indicator in one of a plurality of locations in an ask display region, each location in the ask display region corresponding to a price level along the static price axis, the second indicator representing quantity associated with at least one order to sell the commodity at the current lowest ask price;

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displaying the bid and ask display regions in relation to a plurality of price levels arranged along the static price axis such that when the inside market changes, the price levels along the static price axis do not change positions and at least one of the first and second indicators moves in the bid or ask display regions relative to the static price axis;

displaying an order entry region aligned with the static price axis comprising a plurality of areas for receiving commands from the user input device to send trade orders, each area corresponding to a price level of the static price axis; and

receiving a plurality of commands from a user, each command sending a trade order to the electronic exchange, each trade order having an order quantity based on the default quantity without the user designating the default quantity between commands, wherein each command results from selecting a particular area in the order entry region corresponding to a desired price level as part of a single action of the user input device with a pointer of the user input device positioned over the particular area to both set an order price parameter for the trade order based on the desired price level and send the trade order to the electronic exchange.

2. The computer readable medium of claim 1, wherein the trade orders comprise a combination of trade orders to buy and sell the commodity.

3. The computer readable medium of claim 1, wherein the order entry region further comprises:

a bid order entry region comprising a plurality of areas for receiving commands to send trade orders to buy the commodity, each area corresponding to a price level along the static price axis; and

an ask order entry region comprising a plurality of areas for receiving commands to send trade orders to sell the commodity, each area corresponding to a price level along the static price axis.

4. The computer readable medium of claim 3, wherein the plurality of commands from the user comprises a command sending a trade order to buy the commodity and a command sending a trade order to sell the commodity, and wherein each of the trade orders to buy and to sell have an order quantity based on the default quantity.

5. The computer readable medium of claim 3, wherein the plurality of commands from the user comprises commands sending at least two trade orders to buy.

6. The computer readable medium of claim 3, wherein the plurality of commands from the user comprises commands sending at least two trade orders to sell.

7. The computer readable medium of claim 3, wherein the bid order entry region, the ask order entry region, the bid display region, the ask display region, and the static price axis are all displayed in a single window on the graphical user interface.

8. The computer readable medium of claim 7, wherein within the single window, the bid order entry region overlaps with the bid display region, and the ask order entry region overlaps with the ask display region.

9. The computer readable medium of claim 8, wherein the overlapping of the bid order entry region with the bid display region allows the user to send trade orders to buy the commodity by positioning the pointer over the first indicator and selecting an area corresponding to the current highest bid price, and wherein the overlapping of the ask order entry region with the ask display region allows the user to send trade orders to sell the commodity by positioning the pointer

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over the second indicator and selecting an area corresponding to the current lowest ask price.

10. The computer readable medium of claim 1, wherein the single action of the user input device sets the desired price level based on the particular area and determines whether the trade order is a trade order to buy or to sell the commodity before sending the trade order to the electronic exchange.

11. The computer readable medium of claim 1, wherein the trade order is a buy order if the position of the pointer at the time of said single action is within a bid order entry region, and wherein the trade order is a sell order if the position of the pointer at the time of said single action is within an ask order entry region.

12. The computer readable medium of claim 1, wherein the single action of the user input device consists of a single click of the user input device.

13. The computer readable medium of claim 1, wherein the single action of the user input device consists of a double click of the user input device.

14. The computer readable medium of claim 1, further comprising program code causing the machine to perform the following method step:

dynamically displaying an entered order indicator in association with the price levels arranged along the static price axis.

15. The computer readable medium of claim 14, further comprising program code causing the machine to perform the following method step:

canceling the trade order in response to a subsequent single action of the user input device with the pointer of the user input device positioned over the entered order indicator.

16. The computer readable medium of claim 1, further comprising program code causing the machine to perform the following method step:

receiving a re-centering command to center the inside market in a window of the graphical user interface.

17. The computer readable medium of claim 1, wherein the bid and ask display regions are displayed separately.

18. The computer readable medium of claim 1, wherein the bid and ask display regions and the order entry region comprise columns with a plurality of cells that are displayed as a grid such that the cells of each column are aligned.

19. The computer readable medium of claim 1, further comprising program code causing the machine to perform the following method step:

displaying the price levels of the static price axis on the graphical user interface.

20. The computer readable medium of claim 1, wherein the first and second indicators go outside of a viewable portion of the static price axis due to changes in the inside market, and wherein the first and second indicators are placed back into view by receipt of a re-centering command.

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(12) **United States Patent**
Kemp, II et al.

(10) **Patent No.:** US 7,676,411 B2
(45) **Date of Patent:** *Mar. 9, 2010

(54) **CLICK BASED TRADING WITH INTUITIVE GRID DISPLAY OF MARKET DEPTH**

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This patent is subject to a terminal disclaimer.

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Primary Examiner—Richard Weisberger
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Related U.S. Application Data

(57) **ABSTRACT**

(63) Continuation of application No. 11/415,163, filed on May 2, 2006, which is a continuation of application No. 10/237,131, filed on Sep. 9, 2002, now abandoned, which is a continuation of application No. 09/590,692, filed on Jun. 9, 2000, now Pat. No. 6,772,132.

A method and system for reducing the time it takes for a trader to place a trade when electronically trading on an exchange, thus increasing the likelihood that the trader will have orders filled at desirable prices and quantities. The “Mercury” display and trading method of the present invention ensure fast and accurate execution of trades by displaying market depth on a vertical or horizontal plane, which fluctuates logically up or down, left or right across the plane as the market prices fluctuate. This allows the trader to trade quickly and efficiently.

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28 Claims, 6 Drawing Sheets

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G06Q 40/00 (2006.01)

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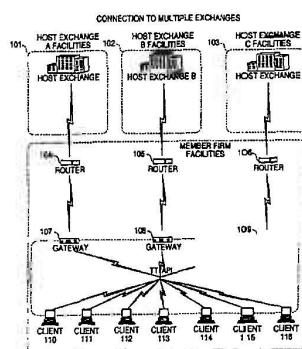
(58) **Field of Classification Search** 705/35-45

See application file for complete search history.

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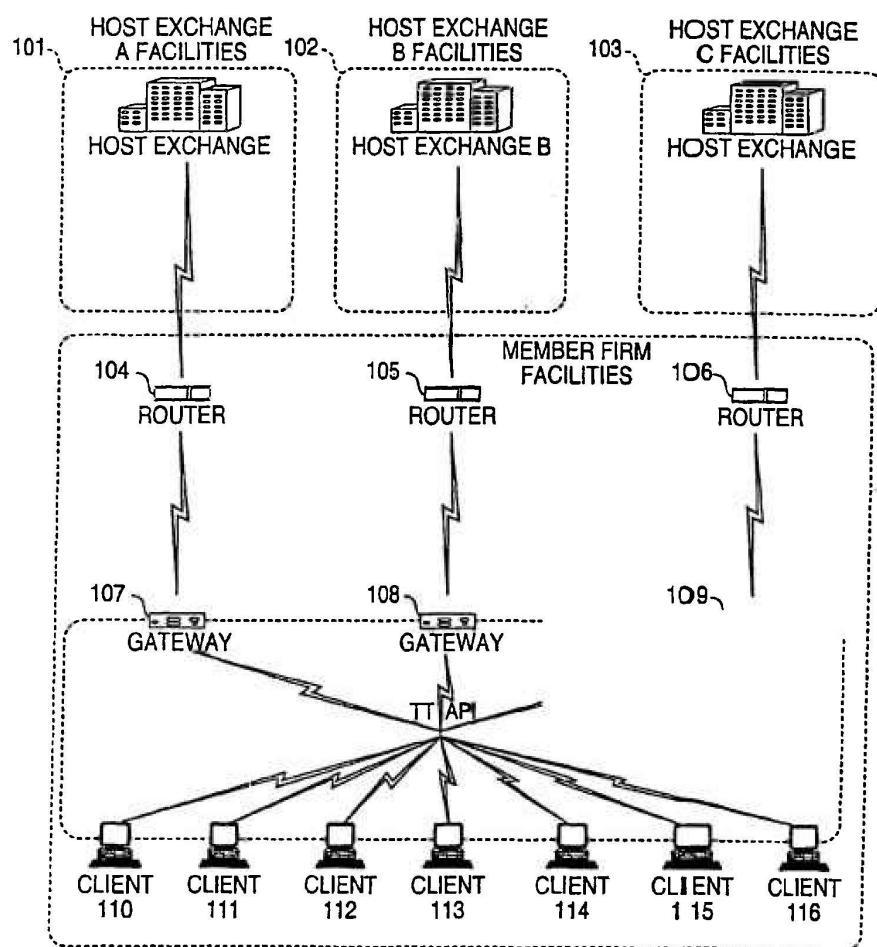
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FIG. 1

CONNECTION TO MULTIPLE EXCHANGES



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FIG. 2

	Contract	Depth	BidQty	BidPrc	AskPrc	AskQty	LastPrc	LastQty	Total
1	CDHO	•	785	7626	7627	21	7627	489	8230
2			626	7625	7629	815			
3			500	7624	7630	600			
4			500	7623	7631	2456			
5			200	7622	7632	800			

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FIG. 3

SYCOM FGBL DEC99

E/W	10:48:44	BidQ	AskQ	Prc	LTQ
1009	L 3		104	99	
1010	R 5		24	98	
1011	720		33	97	
1012	X 10		115	96	
1013	0		32	95	
1014	10 1H		27	94	
	50 3H		63	93	
1007	S 0 W 24		45	92	
	S 0 W 7	CLR			
1015	X 10		28	91	
1016	17 ▽		20	90	10
1008	B 0 W 15	CXL	18	89	
	B 0 W 13	[+]	97	88	
1017	NET 0		30	87	
1018	B 0 W 17	NET REAL	43	86	
1019			110	85	
1021			23	84	
			31	83	
			125	82	
			21	81	
			1001	1002	1003
			1004	1005	1006
					1020

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FIG. 4

SYCOM FGBL DEC99

E/W	10:48:44		BidQ	AskQ	Prc	LTQ
	L	3		104	99	
	R	5		24	98	
	720			33	97	
	X	10		115	96	
	0			32	95	
	10	1H		27	94	
	50	3H		63	93	10
S 10 W 14	1K	5H	43		92	
	CLR					
	X	10	125		91	
	17	▼	97		90	
B 0 W 15	CXL		18		89	
B 0 W 13	[+]	-	97		88	
	NET 0		30		87	
B 0 W 17	NET REAL		43		86	
			110		85	
			23		84	
			31		83	
			125		82	
			21		81	

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FIG. 5

SYCOM FGBL DEC99

E/W	10:48:44		BidQ	AskQ	Prc	LTQ
	L	3		104	99	
1206	R	5		24	98	
1205		720		33	97	
	X	10		115	96	
		0		32	95	
	10	1H		27	94	
	50	3H		63	93	
S 0 W 24	1K	5H		45	92	
S 0 W 7	CLR			28	91	
1204	X	10		20	90	10
	17	▼		89		
B 0 W 15	CXL		18			
B 0 W 13	+/-		97		88	
	NET 0		30		87	
B 0 W 17	NET REAL		43		86	
			110		85	
			23		84	
			31		83	
			125		82	
			21		81	

1208 1201 1202 1203 1207

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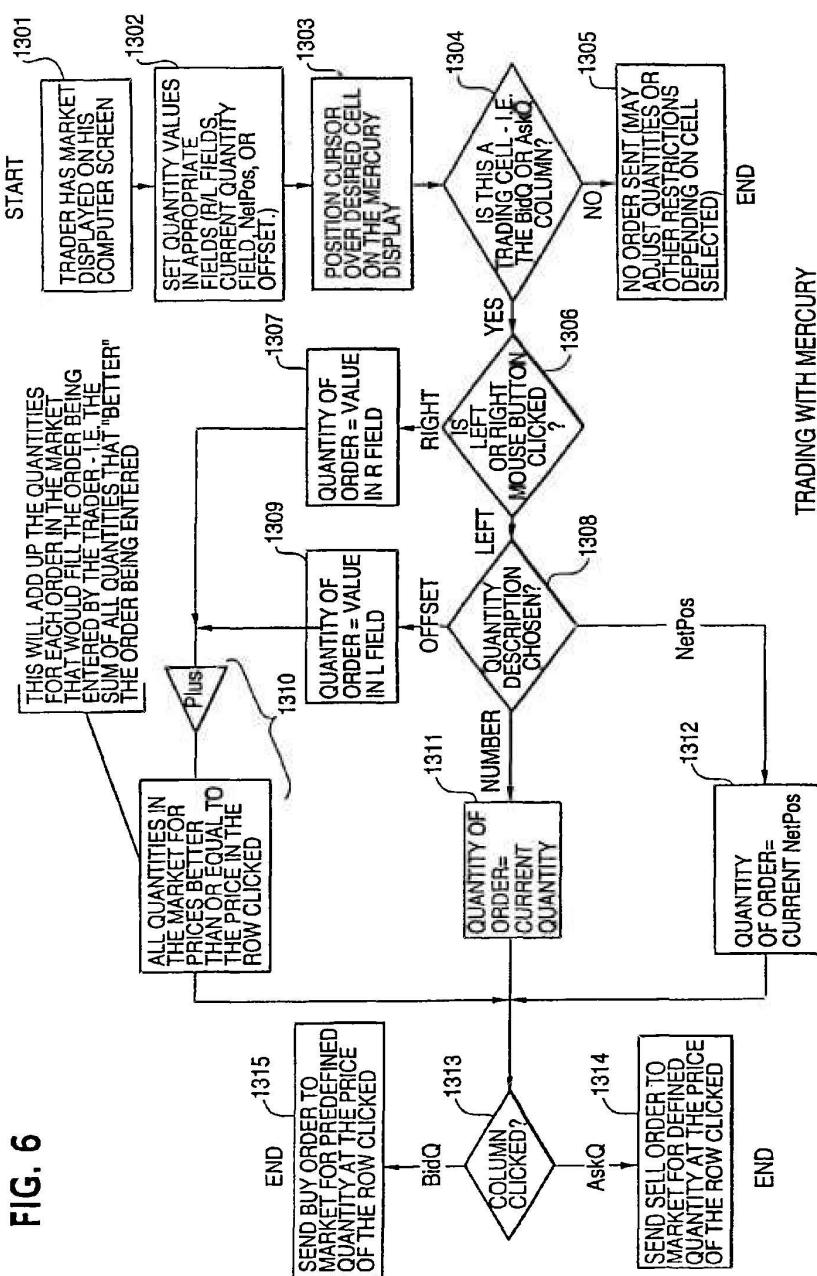
U.S. Patent

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CLICK BASED TRADING WITH INTUITIVE GRID DISPLAY OF MARKET DEPTH**PRIORITY**

The present application is a continuation of Ser. No. 11/415,163, filed May 2, 2006, which is a continuation of Ser. No. 10/237,131, filed Sep. 9, 2002, which is a continuation of Ser. No. 09/590,692, filed Jun. 9, 2000, which is now U.S. Pat. No. 6,772,132, issued Aug. 3, 2004, which claims priority to a U.S. provisional application 60/186,322, filed Mar. 2, 2000, the contents of which are incorporated herein by reference.

The present application claims priority to a U.S. Provisional Patent Application entitled "Market Depth Display Click Based Trading and Mercury Display" filed Mar. 2, 2000, the contents of which are incorporated herein by reference.

FIELD OF INVENTION

The present invention is directed to the electronic trading of commodities. Specifically, the invention provides a trader with a versatile and efficient tool for executing trades. It facilitates the display of and the rapid placement of trade orders within the market trading depth of a commodity, where a commodity includes anything that can be traded with quantities and/or prices.

BACKGROUND OF THE INVENTION

At least 60 exchanges throughout the world utilize electronic trading in varying degrees to trade stocks, bonds, futures, options and other products. These electronic exchanges are based on three components: mainframe computers (host), communications servers, and the exchange participants' computers (client). The host forms the electronic heart of the fully computerized electronic trading system. The system's operations cover order-matching, maintaining order books and positions, price information, and managing and updating the database for the online trading day as well as nightly batch runs. The host is also equipped with external interfaces that maintain uninterrupted online contact to quote vendors and other price information systems.

Traders can link to the host through three types of structures: high speed data lines, high speed communications servers and the Internet. High speed data lines establish direct connections between the client and the host. Another connection can be established by configuring high speed networks or communications servers at strategic access points worldwide in locations where traders physically are located. Data is transmitted in both directions between traders and exchanges via dedicated high speed communication lines. Most exchange participants install two lines between the exchange and the client site or between the communication server and the client site as a safety measure against potential failures. An exchange's internal computer system is also often installed with backups as a redundant measure to secure system availability. The third connection utilizes the Internet. Here, the exchange and the traders communicate back and forth through high speed data lines, which are connected to the Internet. This allows traders to be located anywhere they can establish a connection to the Internet.

Irrespective of the way in which a connection is established, the exchange participants' computers allow traders to participate in the market. They use software that creates specialized interactive trading screens on the traders' desktops. The trading screens enable traders to enter and execute orders,

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obtain market quotes, and monitor positions. The range and quality of features available to traders on their screens varies according to the specific software application being run. The installation of open interfaces in the development of an exchange's electronic strategy means users can choose, depending on their trading style and internal requirements, the means by which they will access the exchange.

The world's stock, bond, futures and options exchanges have volatile products with prices that move rapidly. To profit in these markets, traders must be able to react quickly. A skilled trader with the quickest software, the fastest communications, and the most sophisticated analytics can significantly improve his own or his firm's bottom line. The slightest speed advantage can generate significant returns in a fast moving market. In today's securities markets, a trader lacking a technologically advanced interface is at a severe competitive disadvantage.

Irrespective of what interface a trader uses to enter orders in the market, each market supplies and requires the same information to and from every trader. The bids and asks in the market make up the market data and everyone logged on to trade can receive this information if the exchange provides it. Similarly, every exchange requires that certain information be included in each order. For example, traders must supply information like the name of the commodity, quantity, restrictions, price and multiple other variables. Without all of this information, the market will not accept the order. This input and output of information is the same for every trader.

With these variables being constant, a competitive speed advantage must come from other aspects of the trading cycle. When analyzing the time it takes to place a trade order for a given commodity, various steps contribute in different amounts to the total time required. Approximately 8% of the total time it takes to enter an order elapses between the moment the host generates the price for the commodity and the moment the client receives the price. The time it takes for the client application to display the price to the trader amounts to approximately 4%. The time it takes for a trade order to be transmitted to the host amounts to approximately 8%. The remainder of the total time it takes to place an order, approximately 80%, is attributable to the time required for the trader to read the prices displayed and to enter a trade order. The present invention provides a significant advantage during the slowest portion of the trading cycle—while the trader manually enters his order. Traders recognize that the value of time savings in this portion may amount to millions of dollars annually.

In existing systems, multiple elements of an order must be entered prior to an order being sent to market, which is time consuming for the trader. Such elements include the commodity symbol, the desired price, the quantity and whether a buy or a sell order is desired. The more time a trader takes entering an order, the more likely the price on which he wanted to bid or offer will change or not be available in the market. The market is fluid as many traders are sending orders to the market simultaneously. In fact, successful markets strive to have such a high volume of trading that any trader who wishes to enter an order will find a match and have the order filled quickly, if not immediately. In such liquid markets, the prices of the commodities fluctuate rapidly. On a trading screen, this results in rapid changes in the price and quantity fields within the market grid. If a trader intends to enter an order at a particular price, but misses the price because the market prices moved before he could enter the order, he may lose hundreds, thousands, even millions of dollars. The faster a trader can trade, the less likely it will be that he will miss his price and the more likely he will make money.

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SUMMARY OF THE INVENTION

The inventors have developed the present invention which overcomes the drawbacks of the existing trading systems and dramatically reduces the time it takes for a trader to place a trade when electronically trading on an exchange. This, in turn, increases the likelihood that the trader will have orders filled at desirable prices and quantities.

The "Mercury" display and trading method of the present invention ensure fast and accurate execution of trades by displaying market depth on a vertical or horizontal plane, which fluctuates logically up or down, left or right across the plane as the market prices fluctuates. This allows the trader to trade quickly and efficiently.

Specifically, the present invention is directed to a graphical user interface for displaying the market depth of a commodity traded in a market, including a dynamic display for a plurality of bids and for a plurality of asks in the market for the commodity and a static display of prices corresponding to the plurality of bids and asks. In this embodiment the pluralities of bids and asks are dynamically displayed in alignment with the prices corresponding thereto. Also described herein is a method and system for placing trade orders using such displays.

These embodiments, and others described in greater detail herein, provide the trader with improved efficiency and versatility in placing, and thus executing, trade orders for commodities in an electronic exchange. Other features and advantages of the present invention will become apparent to those skilled in the art from the following detailed description. It should be understood, however, that the detailed description and specific examples, while indicating preferred embodiments of the present invention, are given by way of illustration and not limitation. Many changes and modifications within the scope of the present invention may be made without departing from the spirit thereof, and the invention includes all such modifications.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 illustrates the network connections between multiple exchanges and client sites;

FIG. 2 illustrates screen display showing the inside market and the market depth of a given commodity being traded;

FIG. 3 illustrates the Mercury display of the present invention;

FIG. 4 illustrates the Mercury display at a later time showing the movement of values when compared to FIG. 3;

FIG. 5 illustrates a Mercury display with parameters set in order to exemplify the Mercury trading method; and

FIG. 6 is a flowchart illustrating the process for Mercury display and trading.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

As described with reference to the accompanying figures, the present invention provides a display and trading method to ensure fast and accurate execution of trades by displaying market depth on a vertical or horizontal plane, which fluctuates logically up or down, left or right across the plane as the market prices fluctuates. This allows the trader to place trade orders quickly and efficiently. A commodity's market depth is the current bid and ask prices and quantities in the market. The display and trading method of the invention increase the likelihood that the trader will be able to execute orders at desirable prices and quantities.

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In the preferred embodiment, the present invention is implemented on a computer or electronic terminal. The computer is able to communicate either directly or indirectly (using intermediate devices) with the exchange to receive and transmit market, commodity, and trading order information. It is able to interact with the trader and to generate contents and characteristics of a trade order to be sent to the exchange. It is envisioned that the system of the present invention can be implemented on any existing or future terminal or device with the processing capability to perform the functions described herein. The scope of the present invention is not limited by the type of terminal or device used. Further, the specification refers to a single click of a mouse as a means for user input and interaction with the terminal display as an example of a single action of the user. While this describes a preferred mode of interaction, the scope of the present invention is not limited to the use of a mouse as the input device or to the click of a mouse button as the user's single action. Rather, any action by a user within a short period of time, whether comprising one or more clicks of a mouse button or other input device, is considered a single action of the user for the purposes of the present invention.

The system can be configured to allow for trading in a single or in multiple exchanges simultaneously. Connection of the system of the present invention with multiple exchanges is illustrated in FIG. 1. This figure shows multiple host exchanges 101-103 connected through routers 104-106 to gateways 107-109. Multiple client terminals 110-116 for use as trading stations can then trade in the multiple exchanges through their connection to the gateways 107-109. When the system is configured to receive data from multiple exchanges, then the preferred implementation is to translate the data from various exchanges into a simple format. This "translation" function is described below with reference to FIG. 1. An applications program interface ("IT API" as depicted in the figure) translates the incoming data formats from the different exchanges to a simple preferred data format. This translation function may be disposed anywhere in the network, for example, at the gateway server, at the individual workstations or at both. In addition, the storage at gateway servers and at the client workstations, and/or other external storage cache historical data such as order books which list the client's active orders in the market; that is, those orders that have neither been filled nor cancelled. Information from different exchanges can be displayed at one or in multiple windows at the client workstation. Accordingly, while reference is made through the remainder of the specification to a single exchange to which a trading terminal is connected, the scope of the invention includes the ability to trade, in accordance with the trading methods described herein, in multiple exchanges using a single trading terminal.

The preferred embodiments of the present invention include the display of "Market Depth" and allow traders to view the market depth of a commodity and to execute trades within the market depth with a single click of a computer mouse button. Market Depth represents the order book with the current bid and ask prices and quantities in the market. In other words, Market Depth is each bid and ask that was entered into the market, subject to the limits noted below, in addition to the inside market. For a commodity being traded, the "inside market" is the highest bid price and the lowest ask price.

The exchange sends the price, order and fill information to each trader on the exchange. The present invention processes this information and maps it through simple algorithms and mapping tables to positions in a theoretical grid program or any other comparable mapping technique for mapping data to

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a screen. The physical mapping of such information to a screen grid can be done by any technique known to those skilled in the art. The present invention is not limited by the method used to map the data to the screen display.

How far into the market depth the present invention can display depends on how much of the market depth the exchange provides. Some exchanges supply an infinite market depth, while others provide no market depth or only a few orders away from the inside market. The user of the present invention can also choose how far into the market depth to display on his screen.

FIG. 2 illustrates a screen display of an invention described in a commonly owned co-pending application entitled "Click Based Trading with Market Depth Display" Ser. No. 11/415, 189, filed on May 2, 2006, the contents of which are incorporated herein by reference. This display shows the inside market and the market depth of a given commodity being traded. Row 1 represents the "inside market" for the commodity being traded which is the best (highest) bid price and quantity and the best (lowest) ask price and quantity. Rows 2-5 represent the "market depth" for the commodity being traded. In the preferred embodiment of the present invention, the display of market depth (rows 2-5) lists the available next-best bids, in column 203, and asks, in column 204. The working bid and ask quantity for each price level is also displayed in columns 202 and 205 respectively (inside market—row 1). Prices and quantities for the inside market and market depth update dynamically on a real time basis as such information is relayed from the market.

In the screen display shown in FIG. 2, the commodity (contract) being traded is represented in row 1 by the character string "CDH0". The Depth column 208 will inform the trader of a status by displaying different colors. Yellow indicates that the program application is waiting for data. Red indicates that the Market Depth has failed to receive the data

from the server and has "timed out." Green indicates that the data has just been updated. The other column headings in this and all of the other figures, are defined as follows. BidQty (Bid Quantity): the quantity for each working bid, BidPrc (Bid Price): the price for each working bid, AskPrc (Ask Price): the price for each working ask, AskQty (Ask Quantity): the quantity for each working ask, LastPrc (st Price): the price for the last bid and ask that were matched in the market and LastQty (Last Quantity): the quantity traded at the last price. Total represents the total quantity traded of the given commodity.

The configuration of the screen display itself informs the user in a more convenient and efficient manner than existing systems. Traders gain a significant advantage by seeing the market depth because they can see trends in the orders in the market. The market depth display shows the trader the interest the market has in a given commodity at different price levels. If a large amount of bids or asks are in the market near the trader's position, he may feel he should sell or buy before the inside market reaches the morass of orders. A lack of orders above or below the inside market might prompt a trader to enter orders near the inside market. Without seeing the market depth, no such strategies could be utilized. Having the dynamic market depth, including the bid and ask quantities and prices of a traded commodity aligned with and displayed below the current inside market of the commodity conveys the information to the user in a more intuitive and easily understandable manner. Trends in the trading of the commodity and other relevant characteristics are more easily identifiable by the user through the use of the present invention.

Various abbreviations are used in the screen displays, and specifically, in the column headings of the screen displays reproduced herein. Some abbreviations have been discussed above. A list of common abbreviations and their meanings is provided in Table 1.

TABLE I

<u>Abbreviations</u>			
COLUMN	DESCRIPTION	COLUMN	DESCRIPTION
Month	Expiration Month/Year	TheoBid	Theoretical Bid Price
Bid Mbr(1)	Bid Member ID	TheoAsk	Theoretical Ask Price
WrkBuys(2)	Working Buys for entire Group ID	QAct	Quote Action (Sends individual quotes)
BidQty	Bid Quantity	BQQ	Test Bid Quote Quantity
ThshldBid(6)	Threshold Bid Price	BQP	Test Bid Quote Price
BidPrc	Bid Price	Mkt BQQ	Market Bid Quote Quantity
Bid Qty Accum	Accumulated Bid Quantity	Mkt BQP	Market Bid Quote Price
BidPrc Avg	Bid Price Average	Quote	Checkbox activates/deactivates contract for quoting
AskPrc Avg	Ask Price Average	Mkt AQQ	Market Ask Quote Quantity
AskQty Accum	Accumulated Ask Quantity	Mkt AQP	Market Ask Quote Price
AskPrc	Ask Price	AQP	Ask Quote Price
ThshldAsk(6)	Threshold Ask Price	AQQ	Ask Quote Quantity
AskQty	Ask Quantity	Imp BidQty(5)	Implied Bid Quantity
WrkSells(2)	Working Sells for entire Group ID	Imp BidPrc(5)	Implied Bid Price
Ask Mbr(1)	Ask Member ID	Imp AskQty(5)	Implied Ask Quantity
NetPos	Net Position	Imp AskPrc(5)	Implied Ask Price
FFNetPos	Fast Fill Net Position	Gamma(3)	Change in Delta given 1 pt change in underlying
LastPrc	Last Price	Delta(3)	Change in price given 1 pt change in underlying
LastQty	Last Quantity	Vola(3)	Percent volatility
Total	Total Traded Quantity	Vcga(3)	Price change given 1% change in Vola
High	High Price	Rho(3)	Price change given 1% change in interest rate
Low	Low Price	Theta(3)	Price change for every day that elapses

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TABLE I-continued

<u>Abbreviations</u>			
COLUMN	DESCRIPTION	COLUMN	DESCRIPTION
Open	Opening Price	Click Trd	Activate/deactivate click trading by contract
Close	Closing Price	S (Status)	Auction, Closed, FastMkt, Not Tradable, Pre-trading, Tradable, S = post-trading
Chng TheoPrc	Last Price-Last Close Theoretical Price	Expiry	Expiration Month/Year

As described herein, the display and trading method of the present invention provide the user with certain advantages over systems in which a display of market depth, as shown in FIG. 2, is used. The Mercury display and trading method of the present invention ensure fast and accurate execution of trades by displaying market depth on a vertical or horizontal plane, which fluctuates logically up or down, left or right across the plane as the market prices fluctuates. This allows the trader to trade quickly and efficiently. An example of such a Mercury display is illustrated in the screen display of FIG. 3.

The display of market depth and the manner in which traders trade within the market depth can be effected in different manners, which many traders will find materially better, faster and more accurate. In addition, some traders may find the display of market depth to be difficult to follow. In the display shown in FIG. 2, the market depth is displayed vertically so that both Bid and Ask prices descend the grid. The Bid prices descend the market grid as the prices actually increase. This combination may be considered counterintuitive and difficult to follow by some traders.

The Mercury display overcomes this problem in an innovative and logical manner. Mercury also provides an order entry system, market grid, fill window and summary of market orders in one simple window. Such a condensed display materially simplifies the trading system by entering and tracking trades in an extremely efficient manner. Mercury displays market depth in a logical, vertical fashion or horizontally or at some other convenient angle or configuration. A vertical field is shown in the figures and described for convenience, but the field could be horizontal or at an angle. In turn, Mercury further increases the speed of trading and the likelihood of entering orders at desired prices with desired quantities. In the preferred embodiment of the invention, the Mercury display is a static vertical column of prices with the bid and ask quantities displayed in vertical columns to the side of the price column and aligned with the corresponding bid and ask prices. An example of this display is shown in FIG. 3.

Bid quantities are in the column 1003 labeled BidQ and ask quantities are in column 1004 labeled AskQ. The representative ticks from prices for the given commodity are shown in column 1005. The column does not list the whole prices (e.g. 95.89), but rather, just the last two digits (e.g. 89). In the example shown, the inside market, cells 1020, is 18 (best bid quantity) at 89 (best bid price) and 20 (best ask quantity) at 90 (best ask price). In the preferred embodiment of the invention, these three columns are shown in different colors so that the trader can quickly distinguish between them.

The values in the price column are static; that is, they do not normally change positions unless a re-centering command is received (discussed in detail later). The values in the Bid and Ask columns however, are dynamic; that is, they move up and

down (in the vertical example) to reflect the market depth for the given commodity. The LTQ column 1006 shows the last traded quantity of the commodity. The relative position of the quantity value with respect to the Price values reflects the price at which that quantity was traded. Column 1001 labeled E/W (entered/working) displays the current status of the trader's orders. The status of each order is displayed in the price row where it was entered. For example, in cells 1007, the number next to S indicates the number of the trader's ordered lots that have been sold at the price in the specific row. The number next to W indicates the number of the trader's ordered lots that are in the market, but have not been filled—i.e. the system is working on filling the order. Blanks in this column indicate that orders are entered or working at that price. In cells 1008, the number next to B indicates the number of the trader's ordered lots that have been bought at the price in the specific row. The number next to W indicates the number of the trader's ordered lots that are in the market, but have not been filled—i.e. the system is working on filling the order.

Various parameters are set and information is provided in column 1002. For example, "10:48:44" in cell 1009 shows the actual time of day. The L and R fields in cell 1010 indicate a quantity value, which may be added to the order quantity entered. This process is explained below with respect to trading under Mercury. Below the L and R fields, in cell 1011, a number appears which represents the current market volume. This is the number of lots that have been traded for the chosen contract. Cell 1012, "X 10", displays the Net Quantity, the current position of the trader on the chosen contract. The number "10" represents the trader's buys minus sells. Cell 1013 is the "Current Quantity"; this field represents the quantity for the next order that the trader will send to market. This can be adjusted with right and left clicks (up and down) or by clicking the buttons which appear below the Current Quantity in cells 1014. These buttons increase the current quantity by the indicated amount; for example, "10" will increase it by 10; "H" will increase it by 100; "K" will increase it by 1000. Cell 1015 is the Clear button; clicking this button will clear the Current Quantity field. Cell 1016 is the Quantity Description; this is a pull down menu allowing the trader to chose from three Quantity Descriptions. The pull down menu is displayed when the arrow button in the window is clicked. The window includes NetPos, Offset and a field allowing the trader to enter numbers. Placing a number in this field will set a default buy or sell quantity. Choosing "Offset" in this field will enable the L/R buttons of cell 1010. Choosing "NetPos" in this field will set the current Net Quantity (trader's net position) as the trader's quantity for his next trade. Cell 1017 are +/- buttons; these buttons will alter the size of the screen—either larger (+) or smaller (-). Cell 1018 is used to invoke Net 0; clicking this button will reset the Net Quantity

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(cell 1011) to zero. Cell 1019 is used to invoke Net Real; clicking this button will reset the Net Quantity (cell 1011) to its actual position.

The inside market and market depth ascend and descend as prices in the market increase and decrease. For example, FIG. 4 shows a screen displaying the same market as that of FIG. 3 but at a later interval where the inside market, cells 1101, has risen three ticks. Here, the inside market for the commodity is 43 (best bid quantity) at 92 (best bid price) and 63 (best ask quantity) at 93 (best ask price). In comparing FIGS. 3 and 4, it can be seen that the price column remained static, but the corresponding bids and asks rose up the price column. Market Depth similarly ascends and descends the price column, leaving a vertical history of the market.

As the market ascends or descends the price column, the inside market might go above or below the price column displayed on a trader's screen. Usually a trader will want to be able to see the inside market to assess future trades. The system of the present invention addresses this problem with a one click centering feature. With a single click at any point within the gray area, 1021, below the "Net Real" button, the system will re-center the inside market on the trader's screen. Also, when using a three-button mouse, a click of the middle mouse button, irrespective of the location of the mouse pointer, will re-center the inside market on the trader's screen.

The same information and features can be displayed and enabled in a horizontal fashion. Just as the market ascends and descends the vertical Mercury display shown in FIGS. 3 and 4, the market will move left and right in the horizontal Mercury display. The same data and the same information gleaned from the dynamical display of the data is provided. It is envisioned that other orientations can be used to dynamically display the data and such orientations are intended to come within the scope of the present invention.

Next, trading commodities, and specifically, the placement of trade orders using the Mercury display is described. Using the Mercury display and trading method, a trader would first designate the desired commodity and, if applicable, the default quantities. Then he can trade with single clicks of the right or left mouse button. The following equations are used by the system to generate trade orders and to determine the quantity and price to be associated with the trade order. The following abbreviations are used in these formulas: P=Price value of row clicked, R=Value in R field, L=Value in L field, Q=Current Quantity, Q_a =Total of all quantities in AskQ column at an equal or better price than P, Q_b =Total of all quantities in BidQ column at an equal or better price than P, N=Current Net Position, Bo=Buy order sent to market and So=Sell order sent to market.

Any order entered using right mouse button

$$Bo = (Q_a + R)P \quad (\text{Eq. 1})$$

If BidQ field clicked.

$$So = -(Q_b + R)P \quad (\text{Eq. 2})$$

If AskQ field clicked.

Orders entered using the left mouse button

If "Offset" mode chosen in Quantity Description field then:

$$Bo = (Q_a + L)P \quad (\text{Eq. 3})$$

If BidQ field clicked.

$$So = -(Q_b + L)P \quad (\text{Eq. 4})$$

If AskQ field clicked.

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If "number" mode chosen in Quantity Description field then:

$$Bo = QP \quad (\text{Eq. 5})$$

$$So = QP \quad (\text{Eq. 6})$$

If "NetPos" mode chosen in Quantity Description field then:

$$Bo = NP \quad (\text{Eq. 7})$$

$$So = NP \quad (\text{Eq. 8})$$

Orders can also be sent to market for quantities that vary according to the quantities available in the market; quantities preset by the trader; and which mouse button the trader clicks. Using this feature, a trader can buy or sell all of the bids or asks in the market at or better than a chosen price with one click. The trader could also add or subtract a preset quantity from the quantities outstanding in the market. If the trader clicks in a trading cell—i.e. in the BidQ or AskQ column, he will enter an order in the market. The parameters of the order depend on which mouse button he clicks and what preset values he set.

Using the screen display and values from FIG. 5, the placement of trade orders using the Mercury display and trading method is now described using examples. A left click on the 18 in the BidQ column 1201 will send an order to market to sell 17 lots (quantity # chosen on the Quantity Description pull down menu cell 1204) of the commodity at a price of 89 (the corresponding price in the Prc column 1203). Similarly, a left click on the 20 in the AskQ column 1202 will send an order to market to buy 17 lots at a price of 90.

Using the right mouse button, an order would be sent to market at the price that corresponds to the row clicked for the total quantity of orders in the market that equal or better the price in that row plus the quantity in the R field 1205. Thus, a right click in the AskQ column 1202 in the 87 price row will send a sell order to market at a price of 87 and a quantity of 150. 150 is the sum of all the quantities 30, 97, 18 and 5. 30, 97 and 18 are all of the quantities in the market that would meet or better the trader's sell order price of 87. These quantities are displayed in the BidQ column 1201 because this column represents the orders outstanding in the market to purchase the commodity at each corresponding price. The quantity 5 is the quantity pre-set in the R field 1205.

Similarly, a right click in the BidQ column 1201 at the same price level of 87 would send a buy limit order to market for a quantity of 5 at a price of 87. The quantity is determined in the same manner as above. In this example, though, there are no orders in the market that equal or better the chosen price there are no quantities in the AskQ column 1202 that equal or better this price. Therefore, the sum of the equal or better quantities is zero ("0"). The total order entered by the trader will be the value in the R field, which is 5.

An order entered with the left mouse button and the "Offset" option chosen in the quantity description field 1204 will be calculated in the same way as above, but the quantity in the L field 1206 will be added instead of the quantity in the R field 1205. Thus, a left click in the BidQ column 1201 in the 92 price row will send a buy order to market at a price of 92 and a quantity of 96. 96 is the sum of all the quantities 45, 28, 20 and 3. 45, 28 and 20 are all quantities in the market that would meet or better the trader's buy order price of 92. These quantities are displayed in the AskQ column 1202 because this column represents the orders outstanding in the market to sell the commodity at each corresponding price. The quantity 3 is the quantity pre-set in the L field 1206.

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The values in the L or R fields may be negative numbers. This would effectively decrease the total quantity sent to market. In other words, in the example of a right click in the AskQ column 1202 in the 87 price row, if the R field was -5, the total quantity sent to market would be 140 (30+97+18+(-5)).

If a trader chose the "NetPos" option in the quantity description field 1204, a right click would still work as explained above. A left click would enter an order with a price corresponding to the price row clicked and a quantity equal to the current Net position of the trader. The Net position of the trader is the the trader's current position on the chosen contract. In other words, if the trader has bought 10 more contracts than he has sold, this value would be 10. NetPos would not affect the quantity of an order sent with a right click.

If the trader chose a number value in the quantity description, a left click would send an order to market for the current quantity chosen by the trader. The default value of the current quantity will be the number entered in the quantity description field, but it could be changed by adjusting the figure in the current quantity field 1204.

This embodiment of the invention also allows a trader to delete all of his working trades with a single click of either the right or left mouse button anywhere in the last traded quantity (LTQ) column 1207. This allows a trader to exit the market immediately. Traders will use this feature when they are losing money and want to stop the losses from piling up. Traders may also use this feature to quickly exit the market upon making a desired profit. The invention also allows a trader to delete all of his orders from the market at a particular price level. A click with either mouse button in the Entered/Working (E/W) column 1208 will delete all working orders in the cell that was clicked. Thus, if a trader believes that previously sent orders at a particular price that have not been filled would be poor trades, he can delete these orders with a single click.

The process for placing trade orders using the Mercury display and trading method of the present invention as described above is shown in the flowchart of FIG. 6. First, in step 1301, the trader has the Mercury display on the trading terminal screen showing the market for a given commodity. In step 1302, the parameters are set in the appropriate fields, such as the L and R fields and the Current Quantity, NetPos or Offset fields from the pull down menu. In step 1303, the mouse pointer is positioned and clicked over a cell in the Mercury display by the trader. In step 1304, the system determines whether the cell clicked is a tradeable cell (i.e. in the AskQ column or BidQ column). If not, then in step 1305, no trade order is created or sent and, rather, other quantities are adjusted or functions are performed based upon the cell selected. Otherwise, in step 1306, the system determines whether it was the left or the right button of the mouse that was clicked. If it was the right, then in step 1307, the system will use the quantity in the R field when it determines the total quantity of the order in step 1310. If the left button was clicked, then in step 1308, the system determines which quantity description was chosen: Offset, NetPos or an actual number.

If Offset was chosen, then the system, in step 1309, will use the quantity in the L field when it determines the total quantity of the order in step 1310. If NetPos was chosen, then the system, in step 1312, will determine that the total quantity for the trade order will be current NetPos value, i.e. the net position of the trader in the given commodity. If an actual number was used as the quantity description, then, in step 1311, the system will determine that the total quantity for the trade order will be the current quantity entered. In step 1310, the system will determine that the total quantity for the trade

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order will be the value of the R field (if step 1307 was taken) or the value of the L field (if step 1309 was taken) plus all quantities in the market for prices better than or equal to the price in the row clicked. This will add up the quantities for each order in the market that will fill the order being entered by the trader (plus the L or R value).

After either steps 1310, 1311, or 1312, the system, in step 1313, determines which column was clicked, BidQ or AskQ. If AskQ was clicked, then, in step 1314, the system sends a sell limit order to the market at the price corresponding to the row for the total quantity as already determined. If BidQ was clicked, then, in step 1315, the system sends a buy limit order to the market at the price corresponding to the row for the total quantity as already determined.

It should be understood that the above description of the invention and specific examples, while indicating preferred embodiments of the present invention, are given by way of illustration and not limitation. Many changes and modifications within the scope of the present invention may be made without departing from the spirit thereof, and the present invention includes all such changes and modifications.

We claim:

1. A method of displaying market information relating to and facilitating trading of a commodity being traded on an electronic exchange, the method comprising:

receiving, by a computing device, market information for a commodity from an electronic exchange, the market information comprising an inside market with a current highest bid price and a current lowest ask price;

displaying, via the computing device, a bid display region comprising a plurality of graphical locations, each graphical location in the bid display region corresponding to a different price level of a plurality of price levels along a price axis;

displaying, via the computing device, an ask display region comprising a plurality of graphical locations, each graphical location in the ask display region corresponding to a different price level of the plurality of price levels along the price axis;

dynamically displaying, via the computing device, a first indicator representing quantity associated with at least one trade order to buy the commodity at the current highest bid price in a first graphical location of the plurality of graphical locations in the bid display region, the first graphical location in the bid display region corresponding to a price level associated with the current highest bid price;

upon receipt of market information comprising a new highest bid price, moving the first indicator relative to the price axis to a second graphical location of the plurality of graphical locations in the bid display region, the second graphical location corresponding to a price level of the plurality of price levels associated with the new highest bid price, wherein the second graphical location is different from the first graphical location in the bid display region;

dynamically displaying, via the computing device, a second indicator representing quantity associated with at least one trade order to sell the commodity at the current lowest ask price in a first graphical location of the plurality of graphical locations in the ask display region, the first graphical location in the ask display region corresponding to a price level associated with the current lowest ask price;

upon receipt of market information comprising a new lowest ask price, moving the second indicator relative to the price axis to a second graphical location of the plurality

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of graphical locations in the ask display region, the second graphical location corresponding to a price level of the plurality of price levels associated with the new lowest ask price, wherein the second graphical location is different from the first graphical location in the ask display region;

displaying, via the computing device, an order entry region comprising a plurality of graphical areas for receiving single action commands to set trade order prices and send trade orders, each graphical area corresponding to a different price level along the price axis; and

selecting a particular graphical area in the order entry region through a single action of the user input device to both set a price for the trade order and send the trade order having a default quantity to the electronic exchange.

2. The method of claim 1, wherein the order entry region further comprises:

- a bid order entry region comprising a plurality of graphical areas for receiving single action commands to send trade orders to buy, each graphical area corresponding to a different price level of the plurality of price levels along the price axis; and
- an ask order entry region comprising a plurality of graphical areas for receiving single action commands to send trade orders to sell, each graphical area corresponding to a different price level of the plurality of price levels along the price axis.

3. The method of claim 2, wherein the single action further sets whether the trade order is an order to buy or sell the commodity.

4. The method of claim 2, wherein the bid order entry region overlaps with the bid display region, and wherein the ask order entry region overlaps with the ask display region.

5. The method of claim 4, wherein the overlapping of the bid order entry region with the bid display region allows the user to send trade orders to buy the commodity by positioning the cursor over the first indicator and selecting a graphical area corresponding to the current highest bid price, and wherein overlapping of the ask order entry region with the ask display region allows the user to send trade orders to sell the commodity by positioning the cursor over the second indicator and selecting a graphical area corresponding to the current lowest ask price.

6. The method of claim 1, wherein the trade order is an order to buy the commodity if the position of the cursor at the time of the single action is within a bid order entry region and wherein the trade order is an order to sell the commodity if the position of the cursor at the time of the single action is within an ask order entry region.

7. The method of claim 1, wherein the default quantity is designated to be used for a single trade order.

8. The method of claim 1, wherein the default quantity is designated to be used for a plurality of trade orders.

9. The method of claim 1, further comprising dynamically displaying an entered order indicator at a graphical location aligned with a price level of the plurality of price levels, wherein the entered order indicator represents a user's trade order working at the price level aligned with the entered order indicator.

10. The method of claim 9, further comprising canceling the user's trade order represented by the entered order indicator in response to a single action of the user input device with the cursor of the user input device positioned over the entered order indicator.

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11. The method of claim 1, further comprising receiving a re-centering command to center the inside market in a window of a graphical user interface.

12. The method of claim 1, wherein the bid display region, the ask display region, and the order entry region are displayed vertically or horizontally.

13. The method of claim 1, wherein the bid and ask display regions are displayed separately.

14. The method of claim 1, wherein the plurality of price levels are displayed along the price axis.

15. The method of claim 1, wherein the plurality of price levels do not move except as a result of a manual repositioning command.

16. The method of claim 1, further comprising receiving an input from a user that designates a default quantity to be used for a plurality of trade orders, and receiving a plurality of consecutive single action commands from a user input device, each single action command sending a trade order to the electronic exchange, each trade order having an order quantity based on the default quantity without the user designating the default quantity between the single action commands.

17. The method of claim 16, wherein the plurality of trade orders comprises a combination of trade orders to buy and sell the commodity.

18. The method of claim 1, wherein the single action of the user input device consists of a single click of the user input device.

19. The method of claim 1, wherein the single action of the user input device consists of a double-click of the user input device.

20. The method of claim 2, wherein the single action of the user input device consists of a single click of the user input device.

21. The method of claim 2, wherein the single action of the user input device consists of a double-click of the user input device.

22. The method of claim 10, wherein the single action of the user input device to cancel the trade order consists of a single click of the user input device.

23. The method of claim 10, wherein the single action of the user input device to cancel the trade order consists of a double-click of the user input device.

24. The method of claim 16, wherein the single action command consists of a single click of the user input device.

25. The method of claim 16, wherein the single action command consists of a double-click of the user input device.

26. A computer readable medium having stored therein instructions for execution by a computer to perform the following method steps:

receiving, by a computing device, market information for a commodity from an electronic exchange, the market information comprising an inside market with a current highest bid price and a current lowest ask price;

displaying, via the computing device, a bid display region comprising a plurality of graphical locations, each graphical location in the bid display region corresponding to a different price level of a plurality of price levels along a price axis;

displaying, via the computing device, an ask display region comprising a plurality of graphical locations, each graphical location in the ask display region corresponding to a different price level of the plurality of price levels along the price axis;

dynamically displaying, via the computing device, a first indicator representing quantity associated with at least one trade order to buy the commodity at the current highest bid price in a first graphical location of the plu-

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rality of graphical locations in the bid display region, the first graphical location in the bid display region corresponding to a price level associated with the current highest bid price;
upon receipt of market information comprising a new highest bid price, moving the first indicator relative to the price axis to a second graphical location of the plurality of graphical locations in the bid display region, the second graphical location corresponding to a price level of the plurality of price levels associated with the new highest bid price, wherein the second graphical location is different from the first graphical location in the bid display region;
dynamically displaying, via the computing device, a second indicator representing quantity associated with at least one trade order to sell the commodity at the current lowest ask price in a first graphical location of the plurality of graphical locations in the ask display region, the first graphical location in the ask display region corresponding to a price level associated with the current lowest ask price;
upon receipt of market information comprising a new lowest ask price, moving the second indicator relative to the price axis to a second graphical location of the plurality

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of graphical locations in the ask display region, the second graphical location corresponding to a price level of the plurality of price levels associated with the new lowest ask price, wherein the second graphical location is different from the first graphical location in the ask display region;
displaying, via the computing device, an order entry region comprising a plurality of graphical areas for receiving single action commands to set trade order prices and send trade orders, each graphical area corresponding to a different price level along the price axis; and
selecting a particular graphical area in the order entry region through a single action of the user input device to both set a price for the trade order and send the trade order having a default quantity to the electronic exchange.

27. The computer readable method of claim 26, wherein the single action of the user input device consists of a single click of the user input device.

28. The computer readable method of claim 26, wherein the single action of the user input device consists of a double-click of the user input device.

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UNITED STATES PATENT AND TRADEMARK OFFICE
CERTIFICATE OF CORRECTION

PATENT NO. : 7,676,411 B2
APPLICATION NO. : 11/585907
DATED : March 9, 2010
INVENTOR(S) : Kemp, II et al.

Page 1 of 1

It is certified that error appears in the above-identified patent and that said Letters Patent is hereby corrected as shown below:

Title Page;

At item (56), add the following to the "Other Publications" section:

- Re-exam Certificate for U.S. Patent No. 6,766,304, issued March 31, 2009.--
- Re-exam Certificate for U.S. Patent No. 6,772,132, issued March 31, 2009--.

At col. 1, line 13-17, please delete the paragraph "The present application claims priority to a U.S. Provisional Patent Application entitled 'Market Depth Display Click Based Trading and Mercury Display' filed Mar. 2, 2000, the contents of which are incorporated by reference herein.".

Claim 5, Column 13, lines 37-39: please delete "allows the user to send trade orders to buy the commodity by positioning the cursor" and insert --allows a user to send trade orders to buy the commodity by positioning a cursor--.

Claim 6, Column 13, lines 47-48: please delete "the position of the cursor at the time" and insert --a position of a cursor at a time--.

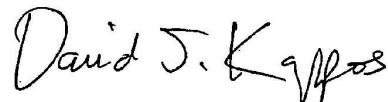
Claim 10, Column 13, line 66: please delete "the cursor" and insert --a cursor--.

Claim 16, Column 14, line 15: please delete "a default quantity" and insert --the default quantity--.

Claim 26, Column 16, line 13: please delete "the user input device" and insert --a user input device--.

Signed and Sealed this

First Day of June, 2010



David J. Kappos
Director of the United States Patent and Trademark Office

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Appx76

TT v. IB (10-cv-715)

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UNITED STATES PATENT AND TRADEMARK OFFICE
CERTIFICATE OF CORRECTION

PATENT NO. : 7,676,411 B2
APPLICATION NO. : 11/585907
DATED : March 9, 2010
INVENTOR(S) : Kemp, II et al.

Page 1 of 1

It is certified that error appears in the above-identified patent and that said Letters Patent is hereby corrected as shown below:

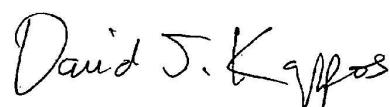
In claim 1, at column 13, line 13, please delete "the user input device" and insert -- a user input device --.

In claim 1, at column 13, line 14, please delete "a price for the trade order" and insert -- a price for a trade order --.

In claim 26, at column 16, line 14, please delete "a price for the trade order" and insert -- a price for a trade order --.

Signed and Sealed this

Tenth Day of August, 2010



David J. Kappos
Director of the United States Patent and Trademark Office

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